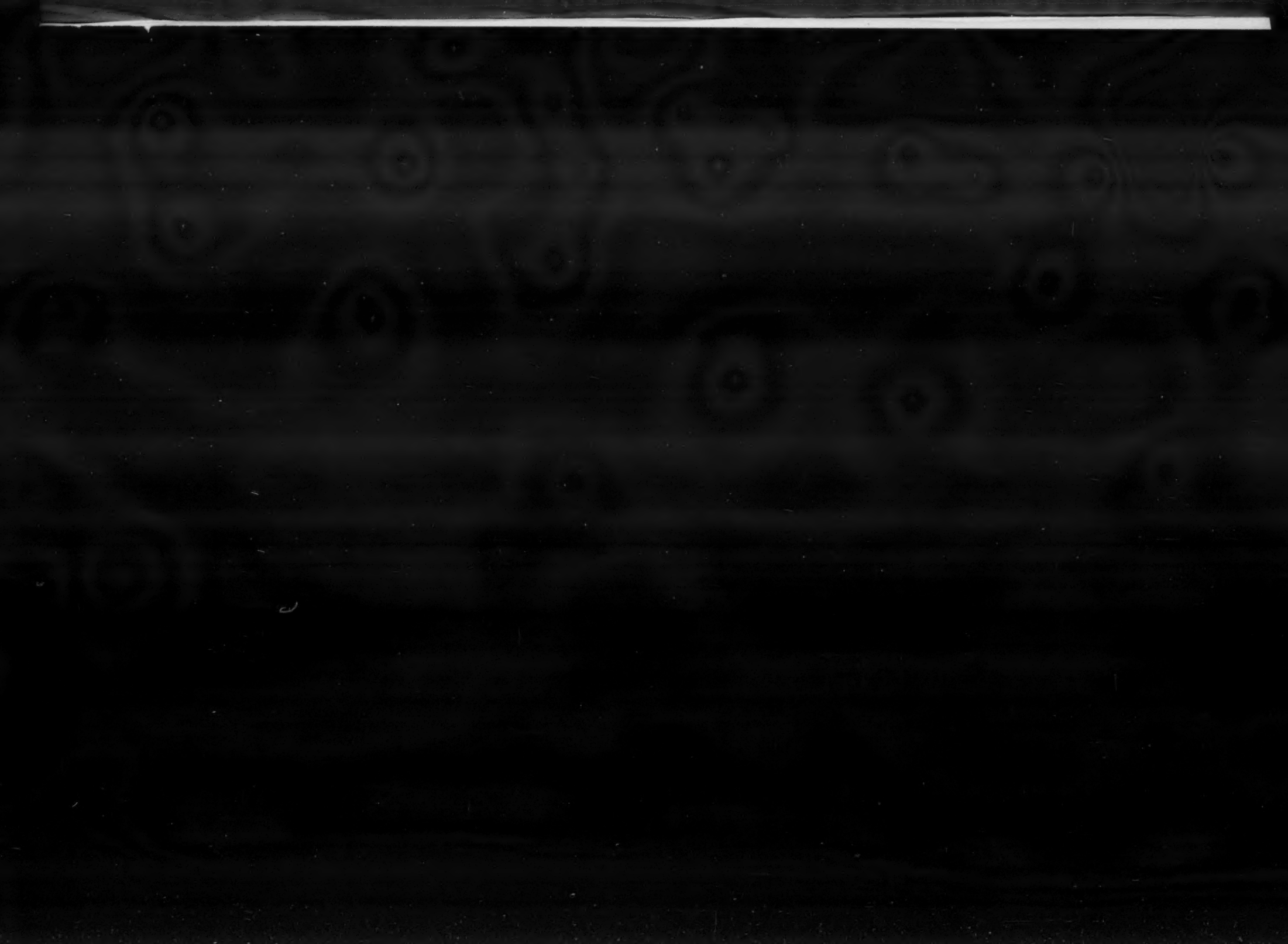
AMERICAN BEE JOURNAL

JULY 1924

WHEN THE CROP IS ON. APIARY OF F. W. LUEBECK, KNOX, INDIANA.



IN THIS ISSUE

JULY 1924

FIFTY YEARS OF PROGRESS IN BEEKEEPING

Next Month—

WATCH FOR THE AWARDS IN THE CONTEST ON

"How to Market Honey"

E. T. MEREDITH
Publisher of "Successful Farming."

BEEKEEPERS interested in seeing a market for honey developed along the same modern lines that have enormously increased the use of oranges, prunes, sugar and many other commodities, will be glad to know that we expect to make announcement next month of the 28 prize winners in the contest on "How to Market Honey."

E. J. WARNER,
President Sprague, Warner & Co.

The three judges, E. T. Meredith, former Secretary of Agriculture and publisher of *Successful Farming;* E. J. Warner, President of Sprague, Warner & Co., and Carroll D. Murphy, head of our advertising agency, have carefully examined the hundreds of entries submitted and are now conferring finally upon the awards.

CARROLL DEAN MURPHY

This contest, which the G. B. Lewis Conpany organized as a 50th anniversary gift to the beekeeping industry, will, we believe, mark a definite forward step by focusing attention on a subject that has been neglected, broadcasting the better methods that progressive beekeepers have developed and pointing the way to a well organized program that may increase the per capita consumption of honey several hundred per cent.

We thank every entrant for the thought he has put into his contribution. Watch for the announcement of the prize winners next month, together with our 50th Anniversary Booklet, "How to Market Your Honey."

AMERICAN BEE JOURNAL

VOL. LXIV—NO. 7 HAMILTON, ILLINOIS JULY 1924

COMBINING CALIFORNIA AND UTAH BEE PASTURAGE

By Frank R. Arnold.

IN the bee world every man has his own ideal of what constitutes ideal bee pasturage. Just as in the dairy world one man upholds Holsteins and another swears by Jerseys, so some bee men place the ideal bee country in Utah, others in South Dakota, and still others in California. The first man to find out that the ideal is a combination of two states was Nephi Miller, of Provo, Utah, and Colton, California. He is the chief guardian of the mellifluous relations that California keeps up with Utah and southern Idaho. When we say mellifluous we really mean "apifluous"—that is, a flowing of bees and not of honey from one state to another. Mr. Miller is the pioneer honey hyphen that binds the two states. If you happen to roam around San Bernardino or change cars at Colton in winter or spring you are sure to run across him somewhere. The beeman from any state will find no more cordial hand held out to him in all the state of California than that of Mr. Miller, and no more interesting story than how he winters his bees in California to get increase from the honey flow of the orange groves and how he transfers them in summer to some spot in Utah, such as Cache Valley, Provo, or Oasis, or else to southern Idaho to get the all summer honey flow from alfalfa or sweet clover. He has been doing this for about seventeen years now and has thus proved that the best bee country in the United States is neither Utah nor California, but a combination of the two. As Longfellow said about man and woman, useless each without the other.

The reason for this is simple. In Utah your bees during the spring have to wait until the alfalfa and sweet clover bloom before they can increase their colonies to a size that will ensure a surplus of honey. This comes too late in the season to ensure a large surplus. If there was a large honey flow in the season from fruit trees or some such source as there is in California, the colony would be able early in the summer to go to work to lay up winter stores. If, however, you can build up strong colonies in California by the orange blossom honey flow, which lasts through April to the middle of May, your bees are all ready to go to work on the surplus. You may wonder why the bees don't stay in California, instead of being brought back to Utah or Idaho pasturage. If they did stay you would reap the same honey harvest that the California beemen do, a most uncertain gamble. After the orange flow, California beemen take their bees up into the highlands of Riverside county for the honey flow from the white and purple sage, a most uncertain source, as only during very rainy years can the sage flowers be depended on to secrete nectar. One California beeman who has been in the San Diego hills for fifteen years has been scarcely able to break even, so undependable is the sage nectar flow. Thus Mr. Miller has solved the problem by using orange, to build up his colonies, and getting back to Utah or Idaho for the abundant harvest.

Even Idaho sometimes fails. Thus Mr. Miller had 750 colonies at Hamer, Idaho, last summer, and though all around were acres of sweet clover as high as a man's shoulder, there was no nectar in the flowers, and yet at Blackfoot, sixty miles away, there was a good yield of honey. Nectar secretion is as capricious as the feminine whims of a sixteen-year-old. Colton is famous for cement, but it is far more interesting to drive about with Mr. Miller than it is to visit cement works. He has nine winter locations, many of them in low, swampy land full of willow bloom, by the Santa Ana river. One of them is on a piece of land priced at $5,000 and renting for $35, and thus the winter rent of the 300 colonies on the location came to only a little over 10 cents a colony. Most of his bees came in January from Idaho and Utah; 1,000 colonies coming from Oasis alone and 1,000 more from Rexsburg. The most typically Californian location that Mr. Miller has is high up in the foothills, on the line between the orange groves and the rocky acres of white and purple sage

Typical Yuma apiary in the shade of mesquite trees (Property of R. E. Crowder.)

overlooking the Santa Ana Valley. When he first bought his twenty acres, in 1911, such land was worth only $10 an acre and people laughed at him for getting so far away from the orange groves. But since then he has developed an orange grove of his own and the Colton orange groves have climbed the hills to meet him, and now for seven miles, from his location to Riverside, the country is solid with orange groves. Besides being on the edge of the orange district, he is also on the edge of the sage country and thus has a location, that in good California years, is within permanent reach of bee food.

The bee treking system includes thus, as we have said, a January emigration west and a May or June one back to Utah. The January one involves no especial danger, as bees suffer far less from cold than the layman supposes. It is the heat of the June railway journey that must be guarded against. One of Mr. Miller's former workmen, Henry Meyer, who is now in business for himself and this year shipped 600 colonies into California from Rigby, Idaho, expects them to increase to 1400, to be shipped back to Rigby late in May. Such will not be really strong colonies, as they will have only four frames of brood, a young queen, and enough honey to carry over for a few weeks. He will ship them with great care, loading them into fifty-foot cars with big doors which will be left wide open. He packs his bees on both sides of the car, two deep on one side and three on the other, and leaving an alley down the center of the car. Each hive has the top screened and the entrance closed, and between the hive layers an air space is left to ensure coolness and air. Water is also sprayed in between the hives three times in the morning and three in the afternoon, if the weather is very warm. The bees are on the road four to five days, and air, coolness, and food are the essentials for a safe journey. The first time the Meyers shipped bees they put them in an iced car, with a comb of water in each hive, but the cars got sidetracked, the ice melted, and honey began to flow out of the car, so that 390 colonies were lost out of 490. Those in the box cars that have been sprayed have never failed to journey successfully.

Mr. Meyer is a good example of how successful a new man may be in the Utah-California bee business. Four years ago he started in business for himself with 300 colonies unpaid for, and now he has 1400, all paid for. He bought four trucks and made a living. Not a bad record for four years. Evidently the annual Utah-California bee-trek pays, for out of these four years he has had no failure, as the first year his colonies averaged 180 pounds and since then about 100 pounds.

The Utah-California combination is now a proved success after the pioneering of Mr. Miller and the work of beemen who have profited by his far-sighted ideas. All are not as yet convinced as to where is the best place to spend the summer. Those who know the Uinta country in Utah would naturally expect that to be the best honey producing section, as nowhere in the world does the alfalfa or the sweet clover bloom more abundantly or with a surer nectar flow. But the Uinta country is remote from railroads. It takes a stage ride of about ninety miles to reach it, so that fact alone bars it from extensive summer bee invasions from California, in spite of the fact that, as Mr. Miller says, as a honey-producing section, "it can't be beat." Colonies there have produced even as high as 540 pounds. So next summer he will range his bees around Blackfoot and Rexburg, both of which have plenty of water and sweet clover pasturage. Other men, besides Henry Meyer, who follow the Miller bee-treking system are the Superior Honey Company of Ogden, Utah, who vibrate between Idaho Falls and Riverside; Jacob Epstein, who goes from Beaver, Utah, to Riverside; Rainey and Krause, who jump from summer quarters in Jerome, Idaho, to Redlands, California; Roy Patten, who goes from Burley, Idaho, to Whittier; and Lincoln Pence, who goes from Jerome to Colton. The Idaho locations are about an acre and a half in size and rent for $25, while the California locations rent all the way from $15 to $50.

A typical apiary in the Yuma Valley, showing need of shade. This is one of R. E. Crowder's apiaries near the Mexican line in Arizona.

Of course, all California and Utah men have not adopted the system. The leading beeman in the Yuma Valley, R. E. Crowder, who with his brother runs about 3500 colonies yearly, says that Yuma Valley bees do not need to make excursions to Utah. Yuma Valley is really in Arizona, but is so near to California that it has practically the same bee pasturage as the Imperial Valley. In the Yuma Valley there has not been a complete failure for twenty years, according to Mr. Crowder. In poor years, such as 1923, the colonies average 50 pounds; in the best years 120, and they sometimes run up to 200 pounds. They can usually count on 100 days of real honey flow, from May 20 to August 15, though the alfalfa and the cotton keep on blooming until frost comes in November. The mesquite blooms in April and used to be the chief bee pasturage, but the mesquite is now disappearing, giving way to fields of alfalfa and cotton. Last year there was no nectar from the cotton, and not much from alfalfa, as there were too many damp winds from the Gulf of California. The best locations are close to the canals, and they need the shade of brush sheds, though a mesquite thicket may do. They must be close to alfalfa and mesquite pasturage and should be out of the wind to help early breeding. Mr. Crowder gives the following list of sources in the valley that afford bee pasturage: The gum and eucalyptus blooms, cottonwood buds, willow blooms, arrow weed, mesquite, alfalfa, and desert willow. The arrow weed is very abundant along roads and canals. It gives a dark honey, but is good for rearing brood. In the whole valley from the Laguna dam on the north to San Luis, just over the Mexican line, there are about eight thousand colonies, and naturally they require no winter protection. In that warm country the summer protection of shade is more important than any winter packing.

Thus Mr. Crowder and Mr. Miller stand for two definite types of prosperous California beemen, one because he has pasturage at home and the other because he roams far afield in search of pasturage. Of course, the Yuma honey output is restricted, while the Utah-California combination offers great possibility of expansion.

Unlike most beemen, Mr. Miller would like to see more people get into the bee business—that is, if they like it and will do it right. A neglected apiary is as bad for the bee business as a city slum is for citizen-

ship. As long as easily discouraged amateurs keep out of the bee business there is no danger for the experts. If you want to go into the business on a small scale you will do well to follow the advice of Dan Hillman, State Bee Inspector of Utah, and run your bees with those of an experienced beekeeper until you have enough practical knowledge and enough colonies to make it worth while to do it alone. Meanwhile you had better plant linden trees and locusts next Arbor Day to help the future prosperity of the bee business.

Logan, Utah.

GRAVITY STRAINER

By C. S. Engle.

For several years I have been interested in finding some simple and rapid method of straining honey. When I produced only a few thousand pounds of honey per year, a piece of muslin or flour sack answered for a strainer. As the years passed and I had thousands of pounds to extract each day during the honey season, it became necessary to use a better strainer.

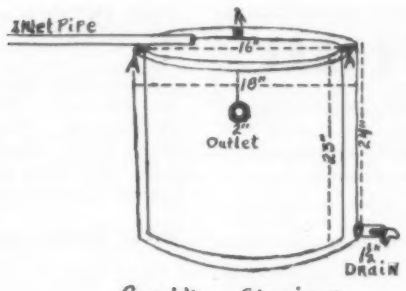
Several types of cloth and wire strainers were tried, but none of them gave complete satisfaction. Most of the strainers described in the bee literature have to be changed or cleaned after a few hours' use. A fine wire mesh strainer is not very satisfactory for this reason. A large muslin bag, hung in the honey tank, makes a very good strainer, but must be changed every day or so, and will not allow a large volume of honey to pass through rapidly.

In the American Bee Journal for July, 1922, R. F. Holterman has a fine article, "The Honey Extracting Season." In this article Mr. Holterman describes his method of taking off and extracting honey. He goes on to say that with the Markle extractor, eight-frame, his crew extract on the average of 6500 lbs. of honey per day. In speaking of straining the honey, Mr. Holterman says: "Unless the honey is warmed, I know of no strainer which is within reach which will strain 800 to 1000 pounds per hour."

Mr. Holterman runs his honey into large tanks and lets it settle over night, then skims off the sediment which rises to the top. I have done the same, but in cool weather the honey does not properly clarify.

In October, 1922, I visited B. M. Caraway, of Riverton, Wyo., and found him using what is known as the gravity strainer. Mr. Caraway is a large honey producer, and had just extracted 100,000 pounds of honey, and all of it had been strained through the gravity strainer. Mr. Caraway and his crew made a record run one day and extracted 11,500 pounds, and the strainer handled it. The honey house is heated, so the honey is warm and extracts easily.

I had a gravity strainer made on the order of the one used by Mr.



Gravity Strainer.

Showing how strainer is made

Caraway, and used it with complete satisfaction the past season. The dimensions of my strainer are pretty large, possibly larger than necessary. The inner can must be smaller in diameter than the outer can, and bottomless, with the bottom edge an inch or so above the bottom of the outer can. This is very necessary, so as to allow the honey to pass freely under the inner can and up through the outlet. The outer can is 24 inches deep, 18 inches in diameter; the outlet is a 2-inch bushing nut soldered into place 8 inches below the top, and the drain at the bottom has a 1½-inch bushing nut soldered in place. No attempt should be made to use a smaller outlet than 2 inches, which can have the necessary length of pipe attached for the overflow. I use a Perfection gate in the bottom to drain the strainer when through. The inner can is also 24 inches in height, 16 inches in diameter, and bottomless.

The honey is pumped to the strainer and rises to the level of the outlet, then it overflows into a large tank. All particles of comb, wax, etc., are retained in the inner can, which should be skimmed each day. I have this strainer placed on a substantial shelf beside the large tank, so that the honey flows from strainer over the edge of the tank.

I have no idea how old this type of strainer is, but had an idea that it was of recent origin until I found it described by J. F. McIntyre on page 248 of Gleanings, April, 1890. Mr. McIntyre's strainer was made of two square boxes, instead of round cans, and the inner box had a fine mesh screen bottom. There was no bottom outlet, which was a mistake, I believe, as honey left in the strainer will granulate, and the strainer is too heavy to lift when full. A. I. Root also comments on Mr. McIntyre's strainer in the same issue. I also find that in Gleanings for June 15, 1892, page 464, Rambler writes of M. H. Mendelson, also of Ventura, Calif., using the gravity strainer. He says: "The strainer cannot clog, and the extractor does not have to be stopped in order to let the honey get out of the way."

Iowa.

CHANGES IN LEWIS MANAGEMENT

Following the very unusual expedient of turning the management of his business over to his employees while he is still in health to guide their operations, Mr. George C. Lewis, President of the G. B. Lewis Company, Watertown, Wis., has placed this rather novel plan in operation.

After careful consideration of various plans to release him from detail responsibility, Mr. Lewis has placed his big plant at Watertown in the hands of a management committee of employees.

The committee will be known as the Management Committee of the G. B. Lewis Company, and will consist of six members: Gordon Frater, Plant Superintendent; Edwin Kaercher, Accountant; T. M. N. Lewis, General Branch Manager; Kennith Hawkins, General Sales Manager, and L. W. Parks, who will act as Executive Secretary of the committee. Mr. George Lewis, now President and General Manager of the company, will act as chairman of the meetings of the committee except those held during his absence. The committee will be in active charge of the management of the business at all times, its decisions being subject to the final approval of the President.

By this plan it is the intention of Mr. Lewis that every employee of warehouses and in the yards and the factory, office, branch offices and plant shall have a vicarious but direct representation on the management committee.

Mr. Lewis has put this plan into effect in the hope that a much better product could be eventually evolved because of the more interested participation of each employee in such problems and at the same time bring about a decreased cost of manufacturing and selling. The proposal has been enthusiastically received by the employees, who are gradually being acquainted with the scheme which is in operation. The G. B. Lewis Company is the well-known manufacturer of Lewis "Beeware."—Watertown Daily Times.

My Big Crop of Honey

On page 99 of the February American Bee Journal I noticed, under the heading, "A Big Crop," what a fine crop another beeman obtained from five hives of bees in 1923.

I agree with this Wisconsin man; I never saw bees work as well as during the past year. To prove that, let me say how much surplus comb honey I took from sixteen colonies. The best yielded 498 pounds, while the least gave me 323 pounds, the average being nearly 400 pounds each.

I agree with the editor in warning readers not to become too enthusiastic over these abnormal crops, as the normal yield is often much less.

A. Russell Paul, Bangor, Pa.

AMERICAN BEE JOURNAL

Established by Samuel Wagner in 1861

The oldest Bee Journal in the English language.
Published Monthly at Hamilton, Illinois.

Entered as second-class matter at the Postoffice at Hamilton, Illinois

C. P. Dadant ---------- Editor
Frank C. Pellett ---------- Associate Editor
Maurice G. Dadant ---------- Business Manager
Subscription Rates: In the United States, Canada and Mexico, $1.50 per year; five years, $6.00. Other foreign countries, postage 25 cents extra per year.

All subscriptions are stopped at expiration. Date of expiration is printed on wrapper label.

QUEENS DAMAGED BY TRAVELING

As early as October, 1888, Doolittle had noticed that queens that traveled through the mails often had their fertility impaired. There is a long article on that subject by him, in Gleanings for October 1st, 1888. In the February, 1889, number of the Revue Internationale, Charles Dadant challenged that statement, by asserting that of the hundreds of queens which he was receiving from Italy every year, he had had no complaints of infertile queens. This was an actual fact. After so many years, and after reading of so many instances of queens losing their fertility in transportation, we have come to the conclusion that the difference in results between Doolittle's experience and that of Charles Dadant, resided in the fact that the queens received from Italy were sent in what might be called "baby nuclei," little boxes with two combs about 3x4 inches, and some 50 bees. We wonder whether it would not be a good plan to return to the shipping of valuable queens on combs in this way. They did not raise any brood in those little combs, but probably the queens laid eggs in them which were eaten up by the bees, for it is averred that bees do eat eggs, when they are in the way, or when they cannot use them.

THE HONEY SEASON

It is too early yet to make any predictions or reports upon the crop of 1924. But the early part of the summer was very backward. We had near-frost weather till May 24th.

The bad weather was evidently universal through the middle states. A correspondent in Louisville, Ky., wrote us May 14th: "The weather has been beastly up to this time."

A Kansas beekeeper wrote us May 22, from Fulton, Kans.: "The season here has been very backward. Of the better than 60 years that I have been on these great plains, I have not seen one any worse."

A Wisconsin beekeeper wrote, on May 25th: This is the worst season for bees I ever saw. There were five days of storm with high winds in the first week of May, with rain and sleet and the whole month has been unpleasant till now. They have not gathered anything this this spring, the temperature standing around 40 degrees most of the time."

However, as we have had the very best crops in seasons that appeared bad in the beginning, there is no cause for discouragement. If the bees breed continuously, so as to be strong when the honey comes, it takes but a few days to enable them to harvest a rich crop. In localities where there are two honey seasons, the failure of the first sometimes insures a heavy second crop, as the bees breed heavily upon the small amount of honey harvested during the first crop.

THE INTERNATIONAL MEETING AT QUEBEC

The Ohio State Association has notified us, through its secretary, Florence Nails, that it will be represented at Quebec. We hope most of the other state associations have taken similar steps. We are looking for a jolly time and some new ideas. Those Kanucks are successful beekeepers.

HOW MANY MATINGS FOR A QUEEN?

For some time past, we have seen the statement repeatedly in some foreign bee journals that queens nearly always need more than one mating to fill their spermatheca with the drone fluid containing the spermatozoids. It is well known that two matings of the same queen have been occasionally reported, but this was thought to be exceptional.

Now comes F. Julien de Mamers, living in Africa, stating that out of 7 queens whose actions he watched, 5 mated twice, 1 three times, and the seventh one 4 times, 24 hours apart (Apiculteur, May, 1924, page 138). So this apiarist places it as a "law" that queens need at least 2 matings as a minimum. His experiments were made in Africa, and it might be possible that the race of bees upon which he experimented had something to do with the facts stated.

He also states that a queen may go out for her wedding flight as early as 48 hours after her birth. Dzierzon wrote 3 to 8 days. He makes the statement that a queen is **never** sufficiently fertilized by a single mating. This we are quite sure is an error.

As many of our queen breeders raise thousands of queens, it seems to me that the above statements of facts might be confirmed or contradicted by a few careful days of watching.

Mr. De Mamers speaks in very disparaging terms of "bookish information." Yet this is the only way in which actual facts may be recorded for the future.

The editor of L'Apiculteur calls the attention of its readers to the fact that, in 1881 (Apiculteur, page 298) Mr. Pierrard de Dombasle gave a relation of observations, showing a number of single, double and even triple matings of a queen, at different times. But the latter observer gives us the impression that the bees are so hasty in removing the organs of the drone from the queen's abdomen that it does not give sufficient time for the filling of the spermatheca from the sperm sack, contrary to Julien de Mamers, who says he "has never seen the bees trying to remove the protruding organs from the abdomen of the queen." Pierrard reports this action in almost every instance. Is it possible that the difference in the breed of bees caused the difference in results?

FOULBROOD AND THE FARM JOURNAL

Some weeks ago one of our readers called our attention to an article in the April number of the Farm Journal, signed A. W. Livingston, Caldwell, Idaho, which article purports to give the cause of foulbrood as the result of carelessness in not sheltering the hives from rain and storms and holds that the disease is not contagious. As this is a recognized erroneous statement, we have written the Farm Journal about it. A disease of the brood which is **not contagious is not foulbrood** and we hope the writer of the article in question may never have to fight the real "Bacillus larvæ," which would cause him to change his opinion. But magazines like the Farm Journal should inform themselves before publishing such statements which go to hundreds of thousands of farmers. The Farm Journal cannot afford to publish erroneous statements.

THE EDITOR'S RECOLLECTIONS

Because of his long acquaintance with the men who have been prominent in the American beekeeping industry the senior editor has frequently been urged to write his personal recollections. He long hesitated to do so, but so many have mentioned the matter to him that he has decided to undertake it. The first of the series will

probably appear in our October number, immediately following the close of the series of letters by Huber. The Huber letters have been of interest to a great many readers and we trust that the Editor's letters will prove of equal interest.

The first of the series will tell about Langstroth, the inventor of the movable-frame hive. The series will be extended for an indefinite period and will deal with many important events in our beekeeping history, including the development of the smoker, the extractor, comb foundation, etc. Men whose names are well known will be discussed as well as some who are not so well known. The editor will welcome suggestions from our readers as to special subjects on which they would like for him to write.

DR. PHILLIPS LEAVES THE BUREAU OF ENTOMOLOGY

We are in receipt of the announcement from Dr. E. F. Phillips that in September-October next he is to resign his position as United States Apiarist which he has held for 19 years and enter the Professorship of Apiculture at Cornell University. We would deplore this, were it not that we understand it to be his choice. We hope and trust his successor in office at the Bureau of Entomology at Washington may be as efficient as he proved to be. We will make due announcement of the appointment when we are informed of it.

PACKING COMB HONEY

The article from Mr. Crane in the present number upon the packing of comb honey gives the results of his experience. There is probably not another beekeeper in the United States who has packed honey and shipped it for so many years as has Mr. Crane.

We began producing comb honey early, also; but we turned to the production of extracted honey almost immediately after the extractor was invented. Our reasons for doing so were the cheaper and greater production of honey, by returning the combs to the bees. But the difficulty of shipping comb honey safely was also an argument against its production. At that time comb foundation was not yet in use. It was difficult to secure combs well fastened to the sections; we were on a small branch of a railroad and all our goods had to be transferred from one line to another.

As we see it, the most important thing in securing success with comb honey shipping is to have the combs well fastened to the walls of the sections and well finished. Following Mr. Crane's advice will usually secure successful transportation.

EVAPORATION OF HONEY

The question of how bees evaporate the extra water in nectar to change it into ripe honey, or, in other words, the ripening of honey by the bees, as discussed by Dr. Brunnich in this number, is not a new question.

As early as 1878, Rauschenfels, of Parma, Italy, published some observations recorded in the Eichstedter Bienenzeitung, page 59, 1879, concerning this question. Feeding his bees upon melon juice, he noticed that they excreted a quantity of liquid as they came to the hive. He noticed also that, when bees are fed upon very liquid food, within the hive, they appear to find it necessary to take wing immediately and return shortly to the hive. Thus he and others took for granted that the bees separated the extra water from the syrup or from the nectar, on the wing, before reaching the hive.

This discussion, published in November, 1879, in the Bulletin of Apiculture, was again discussed by Charles Dadant in the February, 1880, number of the same magazine. He called the attention of beekeepers to a little book, "La Cave des Apiculteurs," published in 1868, by the Jesuit Father Babaz. This beekeeper was in the habit of feeding his bees, at a short distance from his apiary, about 150 feet, with very watery syrup in inverted glass jars, with cloth stoppers. He "baited" such colonies as he desired to feed, by giving them a little food at the hive, thus exciting their activity, and could in this way bait any colony he wished without attracting the attention of other colonies, especially if he did the baiting in the evening.

This man noticed that the bees excreted a certain amount of liquid on their way from the feeding place to the hive. He also noticed a certain amount of excretion from the hive to the feeding place. He fed an enormous amount of very watery food, eight to one, or 80 per cent of water. This is about the proportion of water in very thin nectar, harvested on the blossoms.

By the way, some of our experimenters, noticing the great amount of water in nectar, made the mistake of taking the same proportion for granted, in every case. But nectar is very different in its density, according to many conditions, especially atmospheric conditions, so that although in some cases it may contain 90 per cent of water, in many other cases it contains very little water. There is also a great difference in the honey from different blossoms.

Well, Father Babaz took note of the fact that this water, excreted by the bees, contained so little sweet that it did not leave any trace, by evaporation, which, he said, was evidence that it was only clear water.

Mr. Dadant's conclusion was that the bees evacuated only the water from the honey digested by them or used by them for their own consumption. The studies of Dr. Brunnich would indicate that they actually separate the water from the nectar by this operation as they come to the hive.

However, it is necessary to call the attention of the beekeeper to the fact that not all the bees that take wing, when food is furnished within the hive, are flying out for the purpose of discharging water. Whenever we feed a colony of bees, it creates an excitement, if it is at a time when no nectar is to be found in the field. Active bees, noticing some of their sisters laden with food, become excited and fly out to seek it. Evidently, although they can tell one another that food is to be had, they are unable to tell them where; so when one or more bees have found food and let it be known, many of their sisters at once rush out to seek the source of supply. It is so true that, if you have had any sweets exposed, at any time, to which the bees had access, you will see some bees rush to that spot, very shortly after a colony has been fed. In fact, if you feed a number of colonies, within the hive, it will be but a short time until the colonies fed will be in an uproar and seeking everywhere for sweets.

This handling of sweets by the bees is very interesting. We hope the time is not far when the positive facts will be known, concerning this ripening of honey. Dr. Brunnich is certainly awakening the attention of the scientists on this point.

That there is some evaporation of honey by the fanning of the bees, during the crop, is not to be doubted, however. Charles Dadant, in the article mentioned above, states that, having had a small colony with diarrhoea at the end of winter, he found the unsealed honey, in that hive, overrunning the cells, owing to the moisture which it had absorbed. He placed those combs of watery honey within a powerful colony. The result was a fanning of the bees within the hive and at its entrance, similar to the roar which is heard during a honey crop. At the end of three days, when this roaring ceased, he found all the combs dry and the honey well ripened. So we may say truthfully that, when the bees make a roar at the entrance and within the hive, during a honey crop, they are ripening the honey.

Upon receipt of the article by Dr. Brunnich on the evaporation of honey, we forwarded it to that deep student, Mr. Wallace Park, of Urbana. Mr. Park made a study of the question and forwarded to us his comments upon the same subject, with some very interesting cuts, of his own studies. We reproduce them with his article.

We also reproduce Dr. Brunnich's micrographs that were published by us in 1919, February, page 56. In this way, the student will have the entire subject before his eyes. It is taking more space than we usually allow to one subject in our columns. But the question is important. Until all valid objections are met and overcome, the matter will remain an open subject. This is the only way in which progress is ever achieved.

THE FABLE OF THE RIPENING OF THE HONEY BY EVAPORATION

By Dr. Brunnich, Reuchenette,
Switzerland.

ALMOST without exception, the manuals and teachers of apiculture profess that the superfluous water of the nectar and fresh honey is ridden off by pure evaporation, favored by a strong ventilation in the hive. This ventilation is effected by the fanning bees, who move their wings so rapidly as to produce a current of air in the flight-hole. But if we study the matter somewhat closer we shall see that this theory is not satisfying at all. **Von Planta** already had this conception as he wrote, in his paper on nectars, the following:

"While the nectars contain from 59 to 73 per cent of water, the old honeys hold only 17 to 25 per cent and the young ones 20 to 21 per cent. From this fact we may conclude that the bees eliminate a considerable part of the water of the nectar while in their honeysac. We cannot admit that in the fourteen days in which honey cells remain open much water will evaporate; the examination of young honey freshly poured out by the bees shows that it is already rather concentrated."

There is no doubt that by the fanning of the bees a very slow current of air is produced **beyond the combs;** still slower is the motion of the air from the brood-and-honey room **across the streets** between the combs. But above the cells with the fresh honey the current of air is almost nought, because it is a well known fact that **on the cells with fresh honey there is always a layer of young bees.** We will see later on that these bees are ripening the honey **actively** by sucking it and transporting in other cells. I claim that **the purpose of fanning is quite different.** In those times of fanning, the bees are extremely occupied with nursing, building, cleaning, ripening of honey, etc.; they are obliged to consume much honey and pollen. Therefore a great deal of **carbonic acid** is produced and it is a matter of existence that this poisonous gas be removed. With the carbonic acid the bees breathe out vapours of water as a product of the combustion and a deal of this water is precipitated in the morning upon the cold alighting-board. This dew gave the idea of the evaporation of the nectar, while it is chiefly a product of energetic combustion.

I think most of the experienced beekeepers will agree with me when I say that honey ripens, as a rule, in about three days, if the yield is not exceedingly heavy. How would it be possible that by **pure ventilation** the nectar could be freed of about **50 per cent of water,** especially if we consider the fact that the thicker the honey is the more difficult it will be to extract the water of it.

Already **Doolittle,** the keen observer, claimed that the bees **carry about the fresh honey;** with our hives we can easily perceive this transportation of honey. With a little window we can always see the hindmost comb; in the evening of a good day, in May, we see many cells shining from new honey, but in the morning all this honey has disappeared. Again in the evening of such a day the empty cells in the **broodnest** are filled with honey, while in the morning they are void again. By this carrying about, this honey has been thickened and so the bees have again place for fresh honey.

In the past 60 years many beekeepers have stated that during the honey yield bees coming home are **throwing out a fine jet of liquid** before they enter their door; the same was seen by v. Buttel-Reepen when he fed bees outdoors with thin sirup; flying off, they threw off also a fine spray. Many years ago A. I. Root, who was able to gather of this liquid, established that it was **pure water.**

All these circumstances seem to me to prove the hypothesis of v. Planta. Nevertheless, nobody accepted his assertion, nor did they when **Huillon** brought out his beautiful experiments of 1906, in the "Revue Eclectique."

Huillon proceded as follows: During a good honey flow he took, one evening, from three of his colonies all the honeycombs, and gave them empty ones the following morning. From the **first colony** he took away those combs in the evening of the same day; from the **second** one he removed the combs the following morning; the **third colony** he had placed in the cellar on the evening of the first day, and after three days he took away the honeycombs. He extracted the honey of those combs and found that the honeys had a density of **1.394** (corresponding to 26 per cent of water), and **1.415** (22 per cent of water), and **1.432.** According to Jul. Frey, the density of ripe honey lies **between 1.41 and 1.48.** Therefore the honey of the combs which had been in the cellar was also **ripe.** The fresh honey of the first colony **was not nectar at all,** but already a honey which had about 45 per cent less water than the nectar. It seems that these striking results have been drowned in the large sea of apiarian literature and the theory of evaporation still reigns uncontrolled in the heads and books.

I myself made a similar experiment in the excellent honey year of 1918. In the month of May, I took from a colony a comb with fresh honey and determined the density, which was 1.342. To another colony I had given in the morning empty combs, and in the evening I took out one of those honeycombs with fresh honey. Its density was 1.288. I enveloped both combs with wire-cloth so that no bee could enter, nor could any touch the honey with the tongue. The combs so prepared I hung into a strong colony and left them there eleven days. Ten of these days were very beautiful ones, with an average temperature of 58 degrees F. When I then examined the honeys I found that they had 1.36 and 1.34 of density. **So this honey was far from being ripe.**

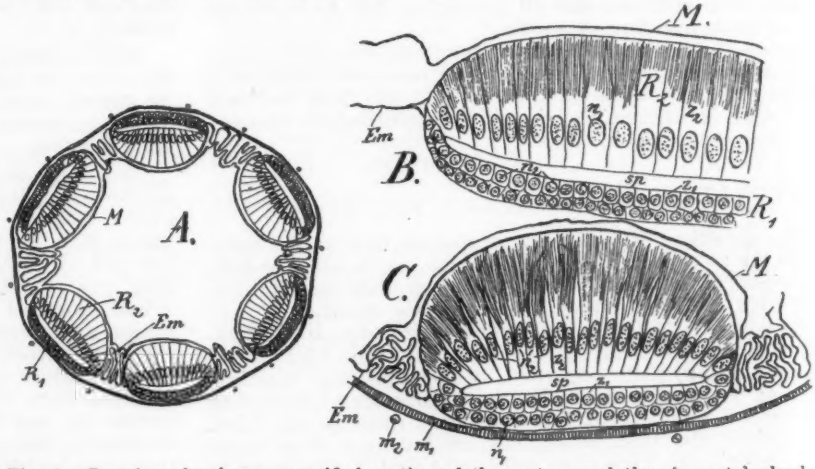


Fig. 1. Drawing showing a magnified section of the rectum and the six rectal glands of the honeybee.

Now let us give some other proofs. There we have the **question of place.** In July of the same 1918 I had an excellent honey flow of raspberries, sage, viper's bugloss, thistles, willow-herbs and other plants which gave a rather clear, aromatic honey. I had extracted on the 31st of May and my scales showed some increases almost constantly. The brood-room was full of brood and pollen, and there

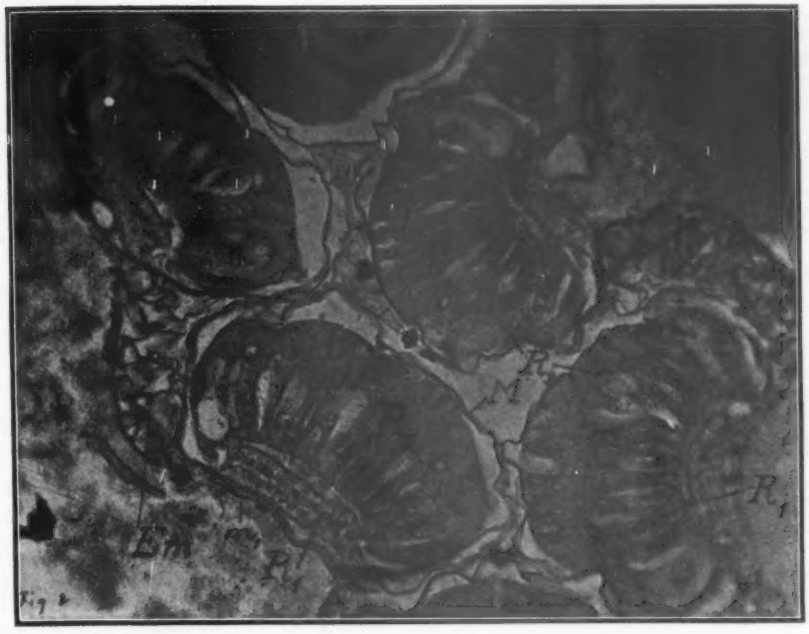


Fig. 2. Microphotograph of the rectal glands of the peritropic membrane.

was also pretty honey in the combs. My hive contained thirteen brood-combs of 365 square inches and twenty-two honeycombs of 104 square inches spread at a greater distance than the brood-combs. From July 5 my increases (from the morning to the evening) were: 7.52, 7.30, 11.24, 15.73 and 6.97 pounds, and the rest of the month, too, gave good surplus. If I suppose that the increase of 11.24 pounds consisted of nectar of 70 per cent of water, which is certainly not too much, then this quantity needed 25,000 cells—twelve of my honeycombs, provided that one cell contained 6.115 drachms, I think as a rule there is in a cell not more that 0.06 drachms of fresh honey, but I wished to calculate surely and not for **my** advantage. This result shows, however, that the bees were not allowed to lavish their space. But if the nectar ought to ripen by evaporation, which advances only very slowly, as my experiment proved, **how would the bees find the room for the 15.7 pounds** of the following day and later? **It is quite an impossible thing!**

For the same month of July, I calculated according to the daily increases and the nightly decreases, with reserves that I cannot describe here, and calculating disadvantageously for myself. I found that under those circumstances the incoming "nectar" (?) could have had at least 33 per cent of water. Had I calculated more correctly this figure would become still much less. All these statements are made with exact figures in the **"Zeitschrift fur angewandte Entomologie,"** the results of which I can give here only in a very abbreviated manner.

Perhaps there are people who are not yet satisfied with my evidences. Therefore I have made one more experiment, the results of which are equally most proving for my **theory of excretion.**

—— My idea was the following: When in the month of October, when not the least is to be found by my bees, I hive a naked swarm on empty combs; if I feed this swarm with very thin food, to which I add a harmless substance which can be established quantitatively, be it physically or chemically, then the following must occur: If the theory of **evaporation** is right, the thickened food must contain proportionately more of the added substance than the original food; on the contrary, if the ripening is done by **excretion** the percentage must approximately be the same in the thin and the thick food.

Well, on October 12 I hived two strong swarms of the heather, the one into a "Spuhler" hive, the other into a "Dadant." To both I gave a food with 43 per cent of sugar, feeding only in the evening. To the food of the first swarm I added a coloring substance—"eosin"—which gives a vivid red color. Till October 19 I gave 1.1 gallons, and the following day, when the rest of the food had scarcely been taken, I removed a comb and shook the sirup on a plate. The density was 1.34; i. e., the sirup had been thickened to nearly half of the former volume. Comparing this liquid with the original food, I found both **equal in coloration.** If the theory of evaporation had been just, the thickened food should have been twice as deep in color as the thin food.

To the food of the second swarm I added **Hyposulfite of sodium** in a proportion of 0.0845 per cent. The strong swarm had only three combs at its disposal, and besides the combs there was empty room. Till October 19 I had given 1.6 gallons of the thin food, and when I looked at my colony the 20th of October I found that the bees had built four pretty pieces of comb, filled with food. I cut them away and pressed the contents on a plate. The density was 1.370; i. e., the volume was not even more than half of the original food. The analysis of the food gave some difficulties because a part of the hyposulfite had been transformed into sulfate. Calculated on the hyposulfite, there was 0.102 per cent of it. But the chemist, Mr. Elser, called my attention to the fact that the bees add sulfuric acid to the food. He examined the Eosin-food and found that the bees had added a quantity of sulfate corresponding to 0.01 of the hyposulfite. Supposing that both colonies acted similarly, I had to subtract this 0.01 per cent, remained 0.092 per cent of the hyposulfite; i. e., 9 per cent more than in the original food. Had the food been thickened by evaporation, the augmentation should have been 100 per cent. The difference of 9 per cent may be attributed to faults of the analysis, or it comes from the fact that **a little part** of the water had been eliminated by evaporation, which I will not deny at all.

I hope that I have now given proofs enough to persuade every man of the impossibility of the hypothesis of evaporation, and I have only to say something on the mechanism of the ripening honey. I can give no other statement than I did already in this journal; the walls of the honeysac are able to take off the water of the content. This water is brought into the **blood-room** which environs the honeysac. With this water the blood of the bee is diluted, and it is of course necessary that the bee be able to discharge that water. In that number of this magazine, I stated that **the rectal glands eliminate the water** of the blood into the rectum. From the rectum it is thrown out in the mentioned spray. I have good reasons for this hypothesis, which can be found in the mentioned German entomological paper.

My conclusions are the following:

1. The nectar, as well as thin sirup, is already concentrated by the bees in the honeysac, the cells of which are able to take off the water of the content of the honeysac and to convey it into the blood-room.

2. The surplus of water in the blood of the bees is eliminated by the rectal glands into the rectum. From here it is ejaculated probably repeatedly during the flight. A deal of this water may be carried off by the trachea during the exhalation.

3. The bees, probably not being able to absorb indefinite quantities of water in their blood, the concentration of the food is effected by the bees carrying about repeatedly the fresh honey. They fill the available cells only very scantily to give a large surface for the air. There is no doubt that a small part of the water is evaporated. By the carrying about of the honey, bees not only concentrate it, but they add to it most important albumins. Those albumins are not important as means of

subsistence, but they have vital qualities for the digestion, the inversion of cane-sugar, etc.

4. In this manner the fresh honey ripens rather quickly; i. e., in about three days, if the honeyflow is not too heavy.

5. The fanning of the bees is most important for carrying off the poisonous carbonic acid of the hive atmosphere.

THE STORING AND RIPENING OF HONEY

By Wallace Park, Associate in Apiculture, University of Illinois.

(The data for this paper were obtained while the author was connected with the Iowa Experiment Station).

THERE can be little doubt but that newly deposited honey has already had a considerable part of its surplus water removed when first placed in the comb, as has been pointed out by the investigations of Von Planta, Huillon and Brunnich. But whether water is removed by passing through the walls of the honeysac into the blood of the bee and thence to the exterior via the rectal glands, as stated by Dr. Brunnich (A. B. J., February, 1919, pp. 56-57, and in this number), is, to my mind, an open question.

At any rate, it is a very clever hypothesis and is supported by the circumstantial evidence of the tiny jet of clear liquid which field bees have been observed at times to spurt out during the homeward journey. But if, as Dr. Brunnich assumes, the young bees remove an additional amount of water by the same means while removing and transporting newly deposited honey from one part of the hive to another, we should expect to find **them** ejecting droplets of clear liquid upon leaving the hive, as at the time of their play flights. So far as I know, such ejections by young bees leaving the hive have not been reported.

Brunnich's experiment, in which he found that combs of fresh honey in wire-cloth protectors placed in strong colonies were far from ripe after eleven days, is good evidence that **evaporation from the cells** is a small factor in the water-reduction process. Other experiments by himself and others point to a similar conclusion. In this respect, they are in full accord with my own observations and conclusions. I am not convinced, however, that evaporation plays such an unimportant role as is suggested by Dr. Brunnich.

The experiments cited by Dr. Brunnich **do not preclude the elimination of water** from nectar or new honey **by means of evaporation while it is in the possession of a bee,** as will appear from the following discussion and the accompanying illustrations.

It is not my province either to affirm or deny the theory of elimination of water by excretion, but I am vitally interested in getting at the truth of the honey ripening process, and present herewith some of my observations and conclusions in the hope that the time when we shall obtain a full understanding of the process may be hastened thereby.

This discussion is concerned particularly with the activities of individual bees engaged in storing and ripening honey, and only incidentally with the physical and chemical changes which occur. There is much uncertainty and misconception in the minds of beekeepers generally as to how nectar is handled by the bees after it is gathered. Although some of their activities along this line have been more or less carefully described heretofore, others seem to have been overlooked. The aims of the present investigation have been to check up on previous descriptions and to secure additional evidence which would lead to a fuller and better understanding of these phases of bee behavior.

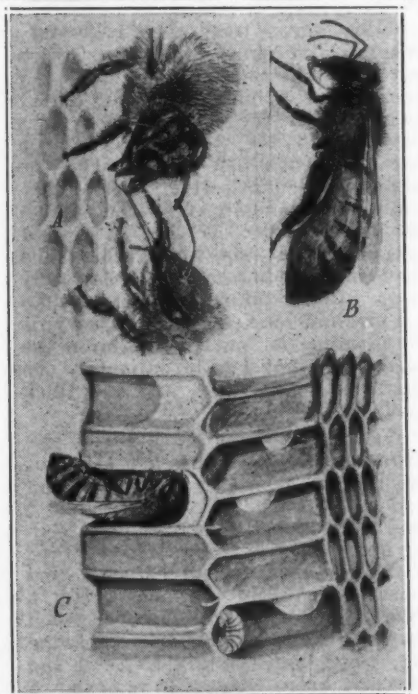


Fig 1. A. Transfer of nectar from field-bee (above) to house-bee (below). B. House-bee ripening nectar. C. House-bees depositing honey.

For the purpose of making observations, glass hives, which contained two Langstroth frames, one above the other, were used, so that individual bees could be followed from the time they entered the hive until they departed. For the purpose of observing bees at work inside the cells, one hive was so arranged that the bees built the combs crosswise in it. This provided a large number of cells having one side formed by the glass wall of the hive. Many of the observations were made on marked bees, while others were made on unmarked bees, which were followed every instant of the time they were in the hive. These studies have been carried on at intervals throughout the past five years.

The Behavior of Loaded Field Bees

It is commonly stated in bee literature that when a bee brings in a load of nectar she goes to a cell and deposits it there. While this probably does occur at times (A. C. Miller is reported by Allen Latham as having seen it. American Bee Journal, Nov., 1907, p. 717), I have failed to see it in the many hundreds of cases which I have observed. The field bee, upon her arrival in the hive, soon delivers her load to one or more workers which may be referred to as house bees. This fact was brought out by G. M. Doolittle, one of our best observers of bee behavior, in the American Bee Journal of September, 1907, page 653; and on page 716 of the November issue of the same year. Doolittle's observations were substantiated by those of Allan Latham, another of our most careful observers. But almost without exception, later writers have continued to expound the old idea that the field-bee deposits its load of nectar in the cell.

The behavior of the loaded field bee is worthy of special notice. She enters the hive with an air of importance. If the source from which she obtained her load is well known to the other fielders, she walks about until she meets a house bee, to which she gives a part of her load. Occasionally she gives her entire load to a single house bee, but usually she distributes it among three or more. It has not been definitely determined why the fielder seldom disposes of her entire load to a single house bee, but there are indications that it is because many of the house bees already have a partial load.

If the nectar source is new or bountiful, the loaded fielder usually performs a peculiar dance, during which she shakes her abdomen vigorously from side to side, all the while running in arcs of circles, turning first to one side and then to the other. She is usually followed by four or five other bees, and while she continues to dance, every now and then one of the interested followers may be seen to leave for the field, until, by the time the dancer is ready to depart, a dozen or more may have left the hive to search out the source of the rich find already discovered by the dancer.

At irregular intervals the dancer pauses long enough to pass out a taste of her booty to one or another of the nearby workers. But soon she meets a house bee to which she gives a considerable portion of her load. As they approach each other, the field bee opens her mandibles wide

apart and forces a drop of nectar out over the upper surface of the proximal portion of her tongue, the distal portion being folded back under the head. Assuming that the house bee approached is not already loaded to capacity, she stretches out her tongue to full length and sips the proffered nectar from the tongue of the field bee, as shown in Figure 1, A. While the nectar is being transferred in this manner, the antennæ of both bees are in continual motion and those of the one bee are constantly striking those of the other. At the same time the house bee may be seen to stroke the "cheeks" of the field bee with her fore feet, as if coaxing for more and more.

When the field bee has disposed of her load, she may start directly for the field, but in most cases she first secures a small amount of food either from another bee or from a cell. But before making her final start she almost invariably gives her tongue a swipe between her fore feet, rubs her eyes and often cleans her antennæ. Then, with a quick look around as if taking her bearings, she sets off for the field in great haste.

The whole process of disposing of her load is often accomplished by the field bee in less time than it takes to describe it. In a previous paper (A. B. J., June, 1922, pp. 254-255) the writer presented data showing that field bees seldom remain in the hive as long as ten minutes between trips, and that when working under favorable honeyflow conditions the most frequent interval spent in the hive was less than four minutes. A few instances were recorded in which a field bee remained in the hive about an hour between trips, but these were exceptions.

Behavior of the House Bee

When the house bee has received her portion of the field bee's load, she meanders about the hive in search of a place where she will not be crowded. Here she usually takes up the characteristic position shown at B in Figure 1, having the long axis of her body in a perpendicular position with head uppermost. She at once begins to go through a series of operations which are illustrated diagrammatically in Figure 2.

Starting with the mouth parts at rest, as shown in the first diagram, the mandibles are opened wide and the whole proboscis is moved somewhat forward and downward. At the same time, the distal (farther) portion of the proboscis is swung outward a little, and a small droplet of nectar appears in the preoral cavity as shown in the second diagram. The whole proboscis is then raised and retracted almost to the position of rest, but is depressed again and is again raised as before, and so on. With each succeeding depression, the distal portion of the proboscis swings outward a little farther than before, but it makes only the beginning of a return to its position of rest.

Accompanying the second depression of the proboscis, an increased amount of nectar appears in the preoral cavity, some of which begins to flow out over the upper surface of the proboscis. As the proboscis is raised and retracted the second time, the beginning of a drop of nectar may usually be seen in the angle formed by its two major portions as shown in the third diagram. This droplet increases in size each time the proboscis is alternately depressed and raised until a maximum droplet is produced as illustrated by the fifth diagram. The bee then draws the entire drop inside its body. As the nectar begins to be drawn in, the drop assumes a concave surface at its lower end, as shown at A in the 8th diagram. The distal portion of the proboscis is extended as at B until the drop has disappeared, when it is again folded back to the position of rest indicated at C.

A bee commonly spends from five to ten seconds in carrying out the series of activities illustrated in Figure 2. This procedure is repeated with only brief pauses for about twenty minutes, although both of these intervals are subject to considerable variation. Upon the completion of this part of the ripening process, the bee searches out a cell in which to deposit the drop she has been concentrating. Into this cell she crawls, ventral side uppermost, as shown in Figure 1, C. This position is characteristic of a bee depositing honey. If the cell is empty, she enters until her mandibles touch the upper rear angle of the cell. The honey is forced out over the dorsal surface of the folded proboscis between the mandibles, which are held well apart. Then, using the mouth parts as a brush, and turning her head from side to side, she "paints" the nectar across the upper wall of the cell so that it runs down and occupies the rear portion of the cell. But if the cell already contains honey, she dips her mandibles into the honey already there and adds her drop directly and without the "painting" process. Thus, my observations on the deposition of honey in the cell agree with those of Arthur C. Miller (Bee Behavior, A B C and X Y Z of Bee Culture, Ed. 1923, pp. 92-96). Our observations on the ripening process differ mainly in that he had observed only part of the process.

When nectar is coming in rapidly, and particularly if it is very thin, the house bees do not always stop to put it through the ripening process, but deposit it almost at once. Instead of depositing the entire load in a single cell, the house bee often distributes a load of such nectar by attaching a small hanging drop to the roof of each of several cells, as shown in three of the cells in Figure 1, C. The hanging drop exposes a maximum surface for evaporation. Later, these droplets are collected and it is assumed that they are then put through the ripening process already described. Whether the nectar is ordinarily put through this ripening process more than once before it is fully ripened was not definitely determined, but it seems probable that it may be worked over several times.

In the light of observations described above, I am not altogether convinced of the necessity for the "excretion" theory, although I would be among the first to support that theory if sufficient evidence could be presented for its support. But the method of honey ripening described herein is not a matter of theory but of observation, and it seems to me to offer adequate means for rapid elimination of moisture by evaporation in that the nectar repeatedly flows out over the proboscis in a thin film. The moisture-laden air is rapidly displaced by that which is drier due to the currents of air induced by the fanners, so that the evaporation process may continue at an undiminished rate. The rapidity of evaporation was evidenced by a decided reduction in the size of the drop which formed in the angle of the proboscis as it was worked and reworked.

Another important phase of the honey-ripening process is the inversion of the sugar. Just how this is brought about is uncertain, but it is supposed that the inversion process is started by the addition of certain enzymes. If such enzymes are the product of some of the so-called salivary glands or other glands which have their outlets among the mouth parts, the process just described would provide ample opportunity for the addition of such substances.

This method does not offer any explanation for the droplets of colorless liquid sometimes spurted out during a heavy honeyflow by incoming bees, but neither does the "excretion" the-

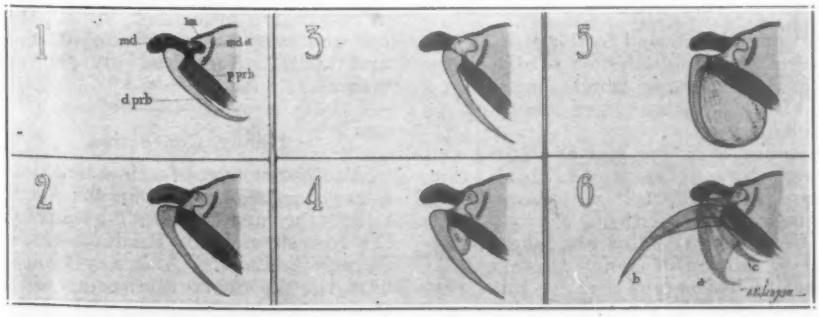


Fig. 2. Sketches of the mouth parts of a bee ripening honey. lm, labrum or upper lip. pc, mouth. md, right mandible or jaw. mda, place of attachment for left mandible. prb, proximal portion of the proboscis. d. prb, distal portion of proboscis.

ory account for the absence of such droplets in the case of outgoing house bees that have been engaged in ripening honey.

The method herein described accounts for the fact that honey when first deposited in the combs is already considerably concentrated. It offers ample opportunity for rapid evaporation and complete ripening, including the addition of enzymes or other products necessary to the production of a thoroughly ripened honey. Moreover, a large part of the process can be observed in operation.

In conclusion, it should be pointed out that the "excretion" theory and the ripening process described above are not antagonistic, and that further investigation may reveal the use of both methods in the honey ripening process.

Summary

The nectar-carrier, upon her return from the field, delivers her load to one or more house bees. These house bees then put the nectar through a process which provides for the rapid evaporation of surplus water and probably permits the addition of enzymes, such as invertose, which are involved in bringing about the chemical transformation of the sugars. When first placed in the comb it has already had a considerable part of its surplus water removed. Later, such honey probably is removed from its cell by other bees and its moisture content further reduced in a similar manner, until its consistency becomes practically that of ripe honey.

SHIPPING COMB HONEY

By J. E. Crane.

IT appears that honey is still being broken in shipping to market. It has been so long since we have had any worth mentioning broken that I had almost forgotten that shipping honey safely was a serious problem to anyone. But I used to lose in shipping honey. It was nearly fifty years ago. I lost on one lot four or five hundred dollars—call it four hundred dollars. If that had been saved and put out at compound interest at 6 per cent, it would today have amounted to more than $6,000. Some loss!

Mr. W. Z. Hutchinson, some years ago, stirred up some thinking when he said that a beekeeper would work all summer to secure a crop of honey and then sell it in fifteen minutes. How much more foolish to work hard to secure a crop of honey and then ship it in such a way as to meet with heavy losses, for want of a little careful thought. Heavy losses in shipping honey are in some ways like falling down the cellar stairs. It sets one thinking. When I had fallen down the second time it set me to thinking and I was not long in thinking that a hand rail would be a good thing. Since putting up a rail of one-half inch galvanized iron pipe I have had no falls. Since packing honey as it should be, we have met with no serious loss.

It was for the greater safety of our comb honey that we began using corrugated paper cases, some fifteen or twenty years ago. These, when properly made, are a great help. If each section is placed in a carton it is still better, and the carton also protects it from dust and insects when taken out of the case.

At first we shipped these paper cases without any other protection, but during and since the "great war" we crate them.

If you can ship in a car that goes to where you sell your honey, crating is not necessary, provided you pack in the car so it cannot slide about or change its position. The combs should run parallel with the sides of the car.

We used to ship in bulk to our larger cities, but now ship in small lots, as it is ordered. Today we are shipping one hundred or more cases to Detroit. Tomorrow we may ship a dozen to Maine and the day after a half dozen to Massachusetts or Connecticut. Under these conditions it would be unwise to ship without crating, as it is likely to be changed from one car to another several times.

Those who handle freight or express matter do not appear, as a rule, to be very conscientious, but handle it in the way that is quickest and easiest, without much regard to consequences. So we must make it difficult for them to throw or break it, so we pack in crates that when filled with six cases of sections will weigh 150 pounds, more or less, placing a few inches of hay, straw or excelsior in bottom of crate to absorb any jars it is likely to receive. We make our crates mostly of cheap lumber, mostly unplaned. The slats will run from ⅜ to ⅝ thick, and we use cement-coated nails that will hold. I do not suppose they cost us more than one-half or one-third as much as factory-made crates would cost; do not look as well, but answer our purpose and save us a good sum each year. By making a large crate or box on castors that would hold 500 pounds of honey, I have made several shipments to Europe without breakage. A few sections distributed to the men on the trains who handle honey is often very useful in getting good service, and is always better than scolding or fault-finding.

Honey is a free gift of nature and many persons seem to think that those who collect it with bees ought to be generous with it.

Unless great pains are taken in securing a crop of honey there will be more or less combs that are but lightly attached to the sides and bottom of section. These should be either sold near home or packed with special care to prevent breakage.

I have forgotten to say that crates or carriers should be made so the top bars will project beyond the ends of the crate for handles for lifting or carrying them. We consider corrugated paper cases much safer than the light wooden factory-made cases, and they have so far cost us much less.

Every crate should have printed in large type on top: "FRAGILE, HANDLE WITH CARE," that those who handle it may know what they are doing.

I doubt if very much attention is paid to such labels, but it is our duty as shippers to do all we can to safeguard our produce from damage.

With these few simple directions followed, honey should go about as safely as pig iron unless a car in which it is shipped meets with some accident.

I have never sued a railroad, or even found fault with it for damage to comb honey. I doubt if it pays. Better charge it up to yourself as a part of your education, for the loss is quite as apt to be your fault as that of the railroads. We know how fragile comb honey is, while those who handle it do not, and it is our part to do all in our power to safeguard it.

Some sixty years ago a beekeeper near here had a lot of honey broken and sued the railroad company for damages and won his suit, after which the company doubled their freight rates on comb honey, and beekeepers had in this way to pay for their losses.

Spreading Out Dark Honey

In some parts of the country the usual grading of honey would be a topsy turvy arrangement, since the lighter are of the least value. This is particularly true in parts of the East having a heavy foreign population, which comes from parts of Europe where dark, strong honies are generally found. In this country they naturally prefer dark, strong-flavored honey. In parts of Pennsylvania and New York buckwheat and the stronger honies are at a premium; the lighter honies would not find a ready sale except on the tables of the wealthier classes.

It might be a feasible thing for honey dealers in these territories to use lighter honey to blend with the dark and strongly-flavored products of the region in order to spread them out and keep the characteristic color and taste so desired by the customers.

Honey Confection

Another new confection containing honey has been put upon the market under the name of "Ap-ho-nut" by the American Fruit Products Co., of Berkeley, Calif. A honey base is used for the confection, composed of apples, oranges, walnuts and raisins. The initial capacity of the plant is 200 pounds per day, but plans are being made to increase it.

EXTRACTED HONEY BY PARCEL POST

By Frank Van Haltern.

The general opinion seems to be that parcel post shipping of honey does not pay. The principal reason seems to be the necessity of heavy packing which makes the weight excessive. By my method of fastening the lids of pails I keep the weight down practically to that of the honey and pail only, and I do not ruin the lid.

Cut two pieces of wire each 41 inches long. I use ordinary stovepipe wire. There are several grades of this wire. By experience I find that the wire must possess considerable stiffness and toughness. A stiff wire will not stretch and become loose, while it must be tough and strong to withstand the twisting necessary to make it tight.

Place the center of the wire against the side of the pail opposite the label and about an inch below the upper rim. Bring both ends around the pail and twist together, being sure to have the two ends equal in length. The twist should come about two inches to one side of one of the "ears" to which the bail fastens. Before making the twist tight slip the encircling wire up on the pail and onto the narrow flat edge of each "ear" that you will notice extends down from the lower side of each. Now, using pliers with a good grip on the point, twist the wires tight. It is very necessary that the wire be as tight as possible without breaking it. Twist together for two or three inches.

Next pull the twisted ends upwards and bring them square across the lid, which should be driven down tight. Use the fingers to work the wire up on the pail at the twisted side as far as possible to be sure it is tight. Having brought the wire across the lid, slip the ends downwards under the wire on the other side. Pull down as tight as possible, then working the encircling wire up with the fingers, bend and pull up one at a time. By alternate pulling on the two ends they can be made tight. Now bring them back and twist about themselves where they come across the lid.

Put another wire on the pail in the same way, but crossing the first on top at right angles. Now cut a block of soft wood an inch thick and one and a half square and slip under the wires where they cross. This rests on the lid and is held tight against it by the tension of the wires. Holding by the block, with the fingers lift the pail and, with a light hammer drive four double-pointed tacks to hold the wires to the block. Lifting by the block prevents hammering the center of the lid down.

To be successful this wiring must be done carefully. The wires must be tight and they must be stiff enough not to stretch and pliable enough to handle. Never use a pail for the parcel post shipping that has once had its lid removed. The first time a lid is put on it sticks and will not leak unless defective. If it has once been removed it comes off the second time much easier and may let honey ooze out. Tie the mailing tag to the cross wires, not to the bail.

The cost of preparation for shipment is very little and I can ship 10 pounds of honey with a shipping weight of 11 pounds. One important advantage of this method is that you get a lot of free advertising from your label. Everyone who handles the pail in the postoffice can read it and I find that they do read it.

I have shipped several thousand pounds of honey this way, had it accepted at three different postoffices and had only one complaint of non-arrival. Most of my shipments have been within the third postal zone, but I have shipped some to the sixth and seventh zones safely.

Iowa.

MAKING INCREASE

By Jay Smith.

There are a great variety of methods of making increase. When a large increase is desired there is probably no better way than to take two or three frames of brood, bees and all, and give a ripe queen cell and put them into a new hive. They must be shut in for a couple of days and it is best to let them out after dark. If released during the day, many of the bees will come out as if the very Old Harry was after them, and they never look around at their hive to see where they came from. They remind me of the old darkey that met a bear in the woods and was making a speedy retreat through the elbow brush when a friend saw him coming and asked, "Say, Ras, whur you all goin' to, anyway?" Ras replied, "I's goin' nowhares. I's jest coming from somewhar." So it is with the bees. They don't seem to care where they are going; their main idea seems to be to get out of that close hive. In this manner many are lost to the newly-formed colony. It is expensive to make increase in this manner, for these weak colonies will make little honey and must be helped by feeding if they would build up strong for winter. In addition, some of the brood will be lost. The Alexander method is good. His way was to place most of the brood in a hive and put it above the original colony with a queen excluder between and the queen below. In nine or ten days all brood in the upper colony would be sealed and this was moved to a new location and given a queen. There would be enough young bees remaining so it was not necessary to close the entrance. There being no uncapped brood in the hive, not many bees were required to keep up the colony heat sufficient to insure the emerging of the brood. The old bees would go back to the old queen and that colony would build up rapidly, while the new one having vigorous young bees would also build up rapidly. This is a good method and the writer has used it with success during a number of seasons.

There is only one objection to this, and that is the time and work it entails. Many times one wishes to do the work at one time and does not find it convenient to take several days to do the job.

I have used a method that, when everything is considered, I believe is superior to any other, where a moderate increase is desired. Take the colony which we wish to divide, lift out one frame of brood with bees and the queen. Place this into the new hive and fill out the remaining space with empty combs if you have them. If not, use full sheets of foundation. Take the old hive that is now queenless and move it to a new location ten or more feet away. Then set the new hive with the queen on the stand formerly occupied by the original colony. A ripe cell or a laying queen is then to be introduced to the new colony on the new stand.

Now there are a number of desirable features about this method. Most of the old bees that were moved will return to the old stand and join their queen. There being only one frame of brood and plenty of bees, the queen will begin to lay at a great rate and will soon build the colony up to a strong one. If this queen is old, she can be replaced after she has the hive filled with brood. Now let us consider the new colony and note some of the advantages of this method. As nearly all of the bees were moved, there will be enough that will stay with the brood in the moved colony to care for it, and I have never seen any brood destroyed. If it is desired to introduce a cell, they will readily accept it if a good feed of syrup is given them, and as it will be several days before many bees will emerge, this time lost will do no harm, for as soon as the queen is mated and ready, the emerging bees will be of sufficient numbers to take care of the young larvæ. If it is desired to introduce a laying queen, this can easily be done, for the young bees will readily accept a laying queen if properly introduced. By the time she is out of the introducing cage, there will be plenty of young bees to care for the brood and the colony will build up very rapidly.

This method can be used to advantage in case one is running his colonies in double brood chambers. In making the increase, leave on the old stand the brood chamber having the least amount of brood. Put the queen in this and move the chamber containing most of the brood to a new location and proceed as before. In this manner strong colonies will result. In case more increase is desired, this may be repeated, but a beginner should beware of making increase too rapidly. Too rapid increase in the summer means rapid decrease in winter.

Indiana.

THE DEVELOPMENT OF THE LOCAL HONEY MARKET

No. 2—How to Plan the Advertising

By G. H. Cale.

IN the first article of this series, a general outline was given of the purposes and plan of the honey-selling campaign conducted by the American Bee Journal. As stated in the June issue, the aim of this work was to develop our own local market on a permanent basis and also to gain a better knowledge of how established marketing methods may be used in selling honey.

To make conditions as difficult as possible we purposely kept out of the market until it had been supplied by other producers and, as explained last month, we feel that, if we had tried to sell our honey with the usual methods, we would not have sold more than a small part of what we were able to dispose of by the methods described.

Honey selling has few points of contact with production, and yet it is usually thought a part of the producer's job to dispose of his crop. Some of the most successful sellers of honey, however, are among those who do not produce a pound. The present marketing study is confined to local selling and we hope to give something that will be of value to every beekeeper who has to depend on his own efforts to sell his product.

In this article we give the main points to be observed in advertising honey locally.

The Purpose of Advertising

Any printed, illustrative, or descriptive matter which is intended to influence the sale of a product favorably may be classed as advertising. It includes newspaper ads, printed handbills, posters, window cards, letters or order inclosures, sales letters, outdoor signs, and displays.

Most advertising is poor. This statement is not made because we are in any degree advertising experts, but because the fact is evident to those who are ignorant of advertising principles. A good advertisement must do each of three things: compel attention, rouse interest, and create the desire to have. It must make sales or it falls short of its purpose.

Most advertising rides on the force of circulation rather than on any force of its own. Conceive of the beekeeper on a country road where autos roll by every day. He puts up a sign, "Honey for Sale." He has circulation for his sign in the thousands that pass. Those who want honey will buy, but has the sign any selling force? No. The farmer simply indexes the honey to public attention and the thing that distributes it is circulation, the circulation of people past his sign. If that sign were in the newspaper it would circulate in the same way.

We will suppose that the beekeeper does a roaring business in honey for a while, but suddenly trade falls off. Why? Other beekeepers have put up "Honey for Sale" signs and the sales to those who want honey are split. Things are not as rosy as they used to be. Of the thousands who passed on the road possibly a hundred stopped for honey, but there were many others who needed honey and did not know their needs.

One enterprising beekeeper, recognizing this fact, begins to sell the hidden qualities of honey. He tells the public how it may be used and creates a desire and a demand from the indifference of people. The beekeeper who does this links salesmanship to circulation and has a double cylindered power.

Important Points

Honey advertising must get people to read, therefore, and not simply say honey for sale. People do not care whether they buy your honey or not. They do not see that which is not conspicuous and they do not read that which is not interesting. It is also certain that but few will buy if you only tell them about your product a few times in a casual way.

It is not necessary to go to large expense for costly pictures or to use high-sounding words. Pretty and elaborate advertisements are not so good as those with old-fashioned selling ideas which bring results. Use all the local atmosphere possible. Talk to the community in its own tongue. Make the message fit with local conditions and habits of buying. In other words, shake hands with your own people as one of them.

The goods you offer for sale should conform in every way with the claims you make for them. In our own efforts we made our package as attractive as possible. We used a lithographed pail in gold, red, black and green, which made a pretty showing on the shelves of the grocery and we made this pail a dominate feature of all our advertising illustrations.

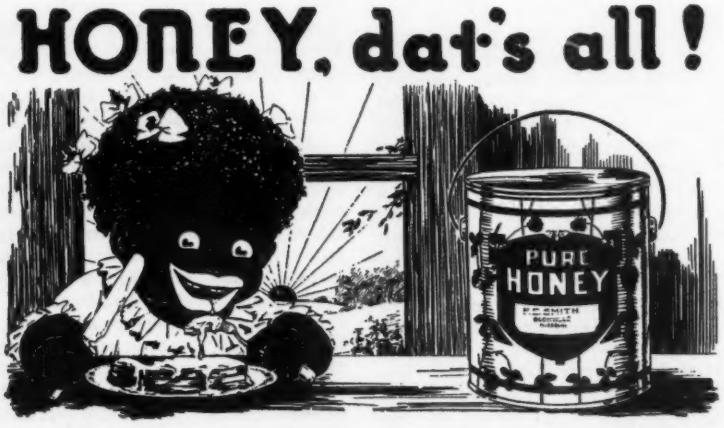
In most successful advertising there is some element which remains unchanged and is used constantly. It pays to give this considerable study and to have the design or motive appear constantly year after year until, by continued repetition, the public recognizes the product immediately.

It is also important to have the advertising carefully planned and to have everything printed and on hand before you are ready to start the work. Contract with your newspaper to use space and prepare the copy, with the dates for its appearance well understood, so there will be no mistakes. We started our advertising a week or ten days before we had placed any honey in the stores and, as a result, we got larger initial orders than we would have otherwise, since the stores had calls for the honey which they had not been able to fill. Grocers felt that they must have a fair supply to fill the future demands.

The Parts of an Advertisement

Every printed advertisement is made up of three chief elements—the copy, or story, the illustration and headline, and the arrangement or layout.

The copy should not be a general statement. It should be to the point and contain no waste words. It should overcome any resistance the prospective customer may have to buying honey. It should emphasize the good points of honey. We found the main weakness was that people did not know how to use it. Most



This humorous figure appeared all through the advertising. In the stores, on cards. It was red and black, both colors attracting the eye well In newspaper and smaller advertising it was solid black. The appeal is evident.

people think it is to be eaten like candy or in quantities on bread and hot cakes. These are worthy uses, but too limited. We made every effort to teach its use in sandwiches with nuts, on toast, on ice creams, as a sweetening for fresh and cooked fruits and in baking.

One of the most difficult arguments to overcome is the belief that honey is too expensive. It is too expensive for the average buyer accustomed to getting ready supplies of cheaper sweets. Point out the superior quality of honey and place it in a position of its own in this respect. We found the objection of price a persistent drag all through our sales work and yet we sold at as low a margin as we could profitably sell.

People need sweet foods and it is a vital need. Our problem is to wedge into buying habits so that customers will turn to the use of honey frequently. Only constant hammering on the superior qualities of honey will make the housewife demand it in preference to lower priced sweets. There must be reasons behind her choice and it is up to us to make those reasons very plain to her.

One of the best ways to write copy is to develop a selling talk by actually selling to the grocer or individual and putting down on paper the things you find successful in making the sales. I have found a good way is to talk to one of my friends, having him argue with me against buying and recording the best ideas. This gives more copy than will be needed, but you can pick out the most important things and hammer them into short, crisp, interesting sentences.

Make your copy timely. If it is Thanksgiving, use Thanksgivng talk. If it is Christmas, use Christmas talk. Do not use sentences much longer than twenty-five words. Paragraphs should not be over five to seven lines, with not over eight words to the line. Do not make general statements. Do not say "Everyone says that honey is good," but "Mrs. Smith says she cannot do without it." Cut out all unnecessary words. Be conversational and friendly. Humanize the copy by mentioning people.

The average reader does not care a whoop about your ad or what you have to sell. He is interested in himself and his own affairs. You must talk to him about his own affairs in terms of your product. Tell him things that already interest him. Give him information about how you produce your honey. Tell him of the wonders of the bee; things that people like to read.

The Headline

The headline is of great importance. It is a long arm to reach out and arrest the reader, and too much thought cannot be given to it. It should be striking and attractive. It will pay to study the headlines in the newspapers, for in them you will find suggestions of value. Above all, the headline must be an invitation to read further. It is often a good plan to prepare the copy first and take that statement from it which will be the most apt to make a sale, using it in the form of a headline.

The headline need not be a type line. It may be a picture. The one we used was a combination of both, as will be seen by the illustration. If you study this you will see that we have followed the fundamentals here given.

It will pay to use the grocer's name in the copy wherever possible, and to get the grocer to include your honey in his own advertising. In our case, several of them advertised our honey without any suggestion from us, showing that they were interested in our efforts.

The Illustration

The most expensive part of the printed advertisement is the illustration. It is not necessary to use an illustration, but it is much harder to write a good ad without one. We preferred to use one design which did not need to be changed, although a frequent change is sometimes better and more forceful We used the design shown in the illustrations and made this the dominant feature of most of our printed matter.

The "Honey" placards were posted in prominent places where they were likely to be noticed by people in passing.

The illustration should have life and action. It should not be a dead picture of an apiary or a nice arrangement of hives and flowers. These do not demand attention and the entire purpose of the picture is to invite attention.

The trade mark may be made a dominant feature of the illustration. You will note that we used the pail, previously mentioned, as a part of the picture and in our store and window cards the design was printed in colors. We propose to use this lively motive of the colored girl and pail year after year until it becomes familiar through constant appearance.

Do not use a picture which will not show up well on the paper used in printing. Some illustrations cannot be made to work successfully without considerable expense. It is best to seek the advice of the local newspaper about this.

The Layout

The arrangement of the ad should be so planned that people will see it immediately. If you had a sheet of perfectly white paper and printed figures on it which were perfectly black you would attract attention. The power to attract is based on contrast. The eye follows the line of least resistance. It is a little lazy. If you want to be seen quickly where there is a crowd of people you will not stand in the middle of the crowd but you will step out into the open space.

If you want to get into the open space in the newspaper, use plenty of white around the type and pictures. This sets off your message and the protecting area of white makes a spotlight so that nothing can reach across the border and disturb the advertising. If your copy is lively and animated, has plenty of life and character, and is protected by border of white as a safeguard, you will have an almost perfect advertisement.

In our own advertising we used a massive black, but sometimes the opposite is just as effective. Three-fourths of the advertisers use black and often an ad which does just the opposite in delicate outline gets more attention.

It is not necessary to use a large amount of space. Figure out the least amount of space in which you can tell your story, but to use less space than is necessary is a waste of money. Change the copy often, and have the advertising appear as frequently as possible.

Outdoor Advertising

Outdoor signs or billboards, handbills and posters are the principal forms of outdoor advertising. We did not use the billboard, since there were none we could get which were satisfactory. Wolfe, of Colorado, uses one successfully and describes it in the December, 1922, issue of the Journal. A sign of this sort which faces the prospect on the way to market from day to day and nudges his elbow in your favor is valuable. These signs should be brief, since they are quickly passed. State your proposition in a forceful and attractive way. Outdoor advertising permits freakish display and spectacular copy, and the headline is especially important. If it is dead, interest never has a chance.

In our own efforts we used the colored girl design printed in colors on a good grade of light-weight paper. These fliers were posted in conspicuous places, wherever we could get a chance to tack them up, and livened things up by putting them in numbers

The delivery truck was liberally supplied with placards showing that honey was our stock in trade.

on the cars which we used in canvassing and in supplying honey to the grocers. Their chief purpose was to arouse curiosity and, at first, they had no information on them other than the "Honey, Dat's All" design. People began to ask "why in the world are those fellows running around with yellow cards stuck all over their cars, and carrying pails of something or other?" Many of our friends stopped and questioned us and they passed the information around by word of mouth that the Dadants were selling honey. Later we used new fliers telling people where they would get the honey.

In our canvass we carried generous quantities of honey leaflets and honey recipes and a mail box stuffer having the advertising design with information below it. In connection with this subject, the use of moving picture slides may be mentioned. These are not outdoor advertisements but they must also be brief and animated to gain attention. If properly prepared such slides will attract a lot of business.

Store Advertising and Selling Helps

Each grocer who handled our honey was given generous quantities of selling helps. The chief one was a stuffer for his order wrappers similar to one used for the mail box. He also included honey recipes and leaflets.

One of the most attractive efforts was the giving away of small samples of honey in small paper cups holding about two ounces. An illustration of these cups is shown here. The label was a lithographed label held on with a good grade of paste. It is sometimes hard to get a label to stick on the paraffined surface, but this may be overcome by using shellac. The giving away of these samples influenced more sales than any other individual effort we made. We used them all through our canvassing. The cups were secured from the Individual Drinking Cup Company of Easton, Pa., and there are other concerns making a similar product.

In each store we used quite a number of cardboard signs designed to attract the eye of the customer and to tell interesting things about the honey. The most conspicuous sign was the "Honey, Dat's All" design in colors on yellow cardboard, hung about in conspicuous places. We found that bright colors are important in signs of this sort, and that they should also be used in sufficient quantities to be sure to attract attention, since they can easily become lost among the numbers of such signs for other products found in every grocery store.

We spent some time trying to discover the principal places to which customers are attracted, to find the eye centers. The front windows are more valuable than the entrance windows. The center of the door is more valuable than the sides. Inside the store the cash register and the lighting cords are good places.

It is important to keep the signs changed and in place. Each time we visited a store we made sure to take out the old cards and put in new ones with different reading and to set up those to be left that had been misplaced or knocked down. The grocer appreciates this interest, also, and his good will is important.

The Costs of Advertising

From this discussion it would appear as though we had put a large amount of money into advertising efforts. We have gone into considerable detail here, but our costs were not large, and it is not necessary that the advertising be expensive. Try different plans and hold on to those which give the best results. The volume of sales and the profits determine the amounts which may be spent for advertising purposes, but it must be remembered that advertising is accumulative and that the first results may not be in proportion to the expense. It may also be taken for certain that any spasmodic attempts to advertise will be likely to meet with failure. Only continued pressure counts in the long run.

We probably tried too many things in this initial work, but it was worth the cost, as we gained much valuable information. We now know what to discard next year and we will probably use new plans which have not yet been considered. Our expense, however, was not large. The sale of a hundred extra pails of honey should cover any reasonable expense, and if the advertising cannot increase the sales by this amount there is something wrong with the plan.

A liberal sample of honey in a paper container proved of great assistance in making sales.

OBSERVATIONS ON BROOD REARING

By J. H. Merrill

Apiarist, Kansas State Agricultural College and Experiment Station

(Contribution No. 332, from the Entomological Laboratory, Kansas State Agricultural College. This paper embodies some of the results obtained in the prosecution of Project No. 126 of the Agricultural Experiment station.)

WHAT are the conditions which exist in a colony of bees that are responsible for the beginning of brood rearing? When and under what conditions does brood rearing reach its peak? What is the maximum rate of brood rearing under conditions similar to those found in Kansas? What effect, if any, does the honey flow have on the rate of brood rearing? When does brood rearing cease under the above mentioned condition? A proper understanding of the answers to the above questions will go a long way toward planning a system of management for the season's work in the bee yard.

The reasons which have been offered as to why brood rearing begins are many. The appearance of pollen and nectar, the rise in temperature, the opportunity for flights, etc., have all been used to answer the question of why brood rearing began in the spring. These results are taken from several colonies which were under observation. The maximum and minimum temperatures for each day are recorded, as is also the amount of precipitation.

During the season of 1922, brood counts were not begun at this station until May 4. As the daily average was found to be far below the number usually accredited to a good gueen, it was thought that possibly the brood counts were commenced too late in the season to record the efforts of the queens when they were at their best. To overcome this objection, the first brood count in 1923 was made on March 2, at which time there was found to have been a daily average of 200 eggs per colony for three days previous to this date.

After this period there followed a considerable time during which no brood was reared, but on March 17 the temperature rose to 59 degrees during the day, but dropped to one degree below before morning. Brood rearing followed immediately upon this drop in temperature and continued at a rather low rate until the 30th of March, when the temperature rose to 60 degrees during the day and then dropped to 19 degrees, after which the rate of brood rearing increased from an average of 100 to a daily average of 600. Now that brood rearing was fairly well established, it continued at varying rates until it closed in the fall. Data which was secured at this station during a four years' experiment on wintering of bees showed that whenever the temperature becomes sufficiently high during the day to encourage a general flight of the bees and in turn followed by a severe drop in temperature, this would be followed in three days by an increased consumption of stores, which indicated that brood was being fed which had emerged from eggs deposited three days previously or immediately following the severe drop in temperature.

From the above data it seems safe to conclude that the beginning of brood rearing does not depend upon pollen, nectar, or rise in temperature, but rather upon a severe drop coming after a period sufficiently warm to enable the bees to indulge in a good flight. A possible explanation of this may be that the bees return to their hives after the flight and, since the temperature is not very low, form a rather loose cluster. The sudden drop in temperature catches them unawares, and in their endeavor to regain an optimum temperature in the hive, they overdo the task, and a temperature sufficiently high in the cluster for brood rearing is the result.

The maximum rate of brood rearing under normal conditions has been variously reported at from 1,500 to 6,000 per day, usually depending upon the enthusiasm of the writer or narrator. Brood rearing counts were carried on at this station during 1922, and the results were so low that we were ashamed to allow the public to know we kept such poor queens. However, when the results obtained by Nolan (Journal of Economic Entomology,, April, 1923, Vol. XVI, pages 117-124) and Brunnich (Archive fur Bienenkunde, Vol. IV, 1922, pages 1-11) were published, we came to the conclusion that our queens were quite normal. It is maintained, and probably with considerable reason, for so doing, that in those countries having a more intense honey flow, the rate of brood rearing is higher. It would be extremely interesting to learn of some definite results on brood rearing studies made in the northern countries. A possible explanation of this has been suggested to me by J. A. Munro, who said that perhaps the rate of brood rearing is really no higher in the North than it is here, yet more bees will be found in the hive at the beginning of the honey flow, due to the fact that the bees resume their activities here much earlier in the spring and, consequently, many are worn out and disappear before the honey flow commences.

The maximum rate of brood rearing averaged 1.720 daily and came during the last week in May. During the season of 1922, the peak of brood rearing was in the first week in May. This condition is quite similar to that reported by both Nolan and Brunnich. However, during the season of 1923, the first brood rearing peak occurred during the first week in May, which was followed during the last week in May by a second and even higher peak. The second peak was due to an unusual condition and reveals an interesting fact in connection with brood rearing. Normally, during this last week in May, the bees would be engaged in gathering nectar from the scanty supply of blooms which would be present at that time. During the last week in May, 1923, the weather conditions were such that the bees were prevented from going to the field. In those hives which were well supplied with stores, the second peak of brood rearing occurred at this time, while the reverse of this condition was found in colonies poorly supplied with food. When it is taken into consideration that the peak of brood rearing usually comes during the first week in May, which is at least six weeks before the beginning of the honey flow, the necessity for giving bees proper attention during the winter months is made apparent.

The fact that colonies that are weak in the spring do not attain their maximum strength until after the honey flow begins has led a great many people to believe that there is a direct correlation between the honey flow and the amount of brood reared. This is probably true with a colony which is weak, due to an insufficient supply of stores, but the reverse of this will be seen to be the case with a normal colony. The honey flow commenced in a very small way about the first week in June and this was followed by a decrease in the daily rate of egg laying from 1,720 to 1,400. The honey flow began to increase on June 17 and reached its height on June 25. This was followed by another decrease in the rate of brood rearing, which gradually continued to decrease until the end of the season. Another slight peak of brood rearing occurred during the last of August and the first week of September, and there was also, during the dates mentioned, a slight increase in the honey flow. The amount of brood was determined every nine days, whereas the honey flow was recorded daily; consequently, if a decrease occurred in the amount of brood it did not become apparent as soon as a change in the amount of honey. On August 26, 27, and September 1 and 2 there was considerable precipitation, which would necessitate the bees remaining within their hives. It is reasonable to assume that the rate of brood rearing increased while the bees were confined to the hive and then began to decrease as soon as the honey flow commenced, because the break in the curve between September 7 and 8 of 520 eggs daily must in reality have begun several days earlier, and probably during the first portion of this period the rate of brood rearing was actually higher than the average rate spoken of in this paper.

If bees possess such a thing as a mind, they might aptly be termed "creatures with a single-track mind," because when conditions are proper for brood rearing they occupy their time with this, yet, when there is a heavy flow of nectar, brood rearing is neglected for the purpose of nectar gathering.

Brood rearing ceased on October 13, which was over a month after the close of the honey flow. Dr. Phillips, in his text book on "Beekeeping," in speaking of the causes for the close of the honey flow, says: "The outside temperature is not high enough for brood rearing without artificial heat production and it is not low enough to cause the bees to produce sufficient heat for brood rearing." That this condition existed with the colonies under observation may be seen by the fact that on October 1 the maximum temperature was 85 degrees Fahrenheit, after which date the maximum hovered between 60 and 70, and the minimum between 44 and 61 degrees, which certainly was too low to induce brood rearing naturally, and yet was not low enough during the day to cause the bees to cluster and raise the temperature of the hive to the point required for brood rearing. The amount of brood reared by months is shown in the following table:

March	2,360
April	25,100
May	38,510
June	41,690
July	33,850
August	23,420
September	11,260
October	840
Total	177,030

The highest rate of egg laying by any queen under observation was the one in colony No. 2, which had an average of 2,030 for the nine days previous to June 21, which decreased to 1,400 during the following nine days. The heaviest honey flow of the year was during this latter period.

If the facts considered in this paper are summed up, it will be seen that first, brood rearing begins when the temperature rises above 57 degrees and remains there long enough for the bees to have a flight and is followed by a severe drop; second, brood rearing reaches its peak or peaks before the honey flow commences; third, the average maximum rate of brood rearing under conditions found in Kansas is less than 2,000 daily; fourth, in a normal colony of bees the rate of brood rearing decreases when the honey flow begins; fifth, the end of brood rearing is caused by a response to the influence of temperature.

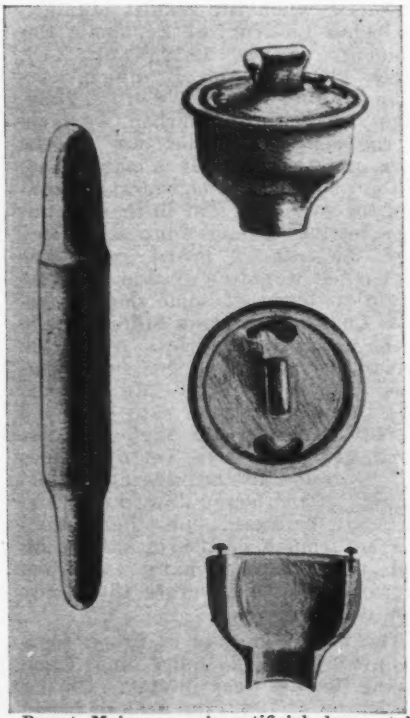
Bees to Canada

One of the largest bee shipments ever handled in the Northwest went through St. Paul May 14 over the Northern Pacific Railway, enroute to Winnipeg, Canada. The shipment contained 800 standard hives of Italian bees and was accompanied by the owner, R. J. Smith, who bought the bees at Conway, South Carolina. The shipment was valued at $4,000 and filled a 70-foot baggage car on the Manitoba limited.

Increased acreages of sweet clover and white clover in the Northwest is boosting the beekeeping industry and more bees and bee supplies are being purchased in Canada, North Dakota and Montana than ever before.

QUEEN CELL IN ACORN CUP

Mr. Dickenson, of the Diamond Match Co. of California, sends us a perfect queen cell inside an acorn cup, as shown above. He tells us that one of their customers, Mr. S. J. Morrison, grafted 12 larvæ in acorn cups, by dampening the cells just a little. Out of these, 9 good queens hatched. It might be very successful to dip acorn cups in hot wax and use them after they are lightly coated in that way. Then the queen cells not only "look like acorn cups" but are actually acorn cups.



Perret Maisonneuve's artificial demountable cell-cup. Taken from his book on queen-raising.

Mr. Perret-Maisonneuve, in his interesting book on queen rearing, uses a demountable queen-cell holder, with a cap, on which he has taken a patent. By dipping this cell-holder in hot wax, two or three times over, one may put the queen cell in it, cover it, and thus have every part of it but the end protected from gnawing by either the bees or the queen. Perhaps the two things might be used in connection with one another. We keep getting more perfected methods all the time, thanks to the ingenuity of men who seek better methods.

A TEXAS HONEY PLANT

A. W. Puett, of Robert Lee, Texas, sends us a specimen of a plant which was in bloom in his vicinity on February 15. It has been identified as **Ephedra antisyphilitica** and is known by the common names of buchu, joint fir, and Mexican ground pine. Mr. Puett writes that his bees have filled every available nook and corner with pollen from this plant and have also stored some surplus honey, but that part of the honey came from agarita (barberry).

He regards it as one of the most valuable plants to the beekeeper in his vicinity because it blooms so early and continues for several weeks. It had already bloomed for more than three weeks at the time his letter was written. This abundant supply of early pollen is invaluable for brood-rearing.

A letter from E. G. LeStourgeon quotes H. B. Parks to the effect that it is a valuable source of both nectar and pollen.

This species of Ephedra is listed as found from Colorado to Texas and Mexico. There are other closely related species common to Utah, California and nearby regions. In American Honey Plants reports of one or another species of Ephedra, said to be important to the beekeepers of the dry regions, are recorded. Mormon tea and Brigham Young weed, canatillo and popotillo are other names by which Ephedra is known in the southwest.

Earthquake Damage to Japanese Beekeepers

Y. Hiratsuka, of Tara, Gifu-ken, Japan, sends us information as to the damages sustained by beekeepers in the earthquake of September 1, 1923.

Over 200 beekeepers were more or less sufferers, losing in all some 600 colonies of bees, besides many colonies injured by losses due to involuntary neglect under the strenuous circumstances.

Much honey was lost. But where honey was saved, the price and demand were very good, owing to the shortage of sugar in Yokohama following the fire.

THE HUBER LETTERS

Kinds of Honey, Swarms, Etc.

To Count Mouxy de Loche:

Dear Sir: I have communicated your letter to the members of our little society; they have learned with great pleasure that you were willing to join and have asked me to say it to you.

Mr. Jurine, to whom I have given your letter to remind him of what you are expecting of him, informed me that he had not yet proposed your name to our Society of Physics and Natural History, but that he was to do so at its next special meeting; it is to be held at my home on the 28th of this month and, as I will preside at it, you may be sure that this question will be brought forward and that my vote will be in your favor.

I have no doubt, sir, that all the communications which you will be willing to send to the editors of the British Library will be received with the eagerness that they deserve; I will be, in particular, charmed to know your observations on the redoubtable Atropos, on the cause of its screech, its proboscis, etc; your drawing will render these matters still more interesting, it might be possible to have that engraved here.

Have you not practiced draughting yourself? My father was successful in this art, as well as in all those to which he applied himself; however, although he was very careful, we were constantly afraid for him of the effects of the use of aqua-fortis.

Mr. Jurine read to us the other day his memoir on the wings of flies and showed us the fine sketches of his daughter. This memoir and those sketches will remain in his desk, owing to the impossibility of having those fine plates engraved.

A person of my acquaintance had this year 11 hives devastated by the Atropos; if one does not wish to lose them all next summer, it will be absolutely necessary to protect them against this formidable enemy by some method analogous with the one which I have indicated. In their native country bees doubtless know better how to resist those invasions than in the countries to which they have been transported and in which they do not possess their full energy.

Proust wrote to La Mettrie, November 19th: "There are two honeys; the one usually liquid and the other dry, not deliquescent, crystallizable in a way and less sweet than sugar. They may be separated with alcohol; for that purpose one must operate upon granulated honey." It is to be regretted that there are not more details. If this man Proust was not in Spain, that is to say at the end of the world, I would have asked him for the details.

As far as I can remember, the Ancients distinguished three sorts of honey; I will hunt that up in Pliny. For want of studying their writings one often gives as a novelty that which was running the streets in the days of Aristotle.

I have lately seen the Count de Flumet, still amiable, happy and healthy.

I thank you, sir, that you wish to secure my son's work on bumblebees (Observations on several species of bees. Linnean Society). You would have received it long ago if it was in our hands. There is only one copy here, in an English collection which belongs to the Public Library. Those which have been printed in London have not yet reached us.

He read, last Thursday, at the public meeting of the Society of Physics and Natural History, a little memoir upon the relation of ants with aphides; it appeared to me that they were well pleased with it. I hope that the encouragements which he received in that occasion will strengthen his taste for natural history. They have asked me to send this memoir to the British Journal. He hesitated to accept so much publicity, and as for me, I am not displeased that he be modest and timid.

I have the honor to be, sir, with perfect regards, your devoted servant. Huber.

Geneva, Feb. 19, 1805.

To Count Mouxey de Loche:

It is a long time, sir, since I have had the pleasure of news of you; I believe it is my fault, but that does not help me to resign myself to it. Not being able to write myself, I do not always reply as soon as I would like. I must spare the eyes which are loaned me and which I make use of more than I ought. This is the only cause of my neglect, for I think of you quite often, sir, the similarity of our tastes would assure you of this, without the fact that I know how much I gain through your communications.

Your memoir upon the plants that bees prefer, and upon the succession of those which it would be proper to put in their reach every season, has much interested me. I have presented it to our Society of Naturalists which held a meeting at my home on the first Tuesday of June; it pleased our colleagues and it was placed in our archives.

I have missed two meetings of the Society of Physics and Natural History, the bad weather having prevented me from going there. We are to have one tomorrow at the home of Professor Pictet; he always knows how to make them interesting. I would very much like to enjoy this meeting with you, sir; will you not come once, take your place in our two societies? We would all be charmed to see you and to hear the reading of some fragments from your portfolio. I am, for my part, extremely desirous of it.

This year, of which so many complain, this low degree of heat, those continuous variations in temperature are not favorable to bees. Never were the queens as prolific, to my knowledge, at least. Our hives have given two swarms each and sometimes three, without the mothers being much weakened. They even say that they have seen some first swarms cast a swarm also; but they exaggerate on good things as well as on bad things. They assured me the other day that some hives had cast five or six swarms and they affirmed that such a thing was not rare in Rumilly (In Haute-Savoie). Do me the favor, sir, to get some information upon this.

Honey and honeydew have never been more abundant; the work in wax has not been suspended, as it usually is after the hay harvest, and especially during the years of drouth, because the cut-over meadows have quickly grown and blossomed again, thanks to the alternating rains and fine weather. Propolis was not scarce either as during preceding years.

I find drones in some hives later than usual. I have still a good many in one of my glass hives, while other hives have chased them and killed them long ago.

Mr. de Gelieu wrote me the other day that there was only one year in ten when bees were as happy in our climate; have you made any such observation?

An amateur writes me that, in Italy, they believe that they can preserve bees against moths by placing within the hive a piece of Russia leather; not that the moths be afraid of its odor, it attracts them, but because they lay their eggs under this leather, so that the colonies are protected. But you understand that one must examine them every morning to remove the eggs. While we wait for the proof of this remedy, it appears to me to be rather dangerous; the man who could find a better one would render a great service to those who cultivate them.

Has the Sphinx Atropos multiplied as much as it was believed it would? If it lays its eggs in the ground, the winter rains will have caused a great many to perish. But besides that, sir, be sure and protect your hives against its attacks and place good crates at the entrances before the insect appears in your country.

You will greatly oblige me if you will write me of your bees and your work. I will learn with interest some news of the health of yourself and of your family.

I have the honor to be, with perfect regards, your devoted servant.

F. Huber.

Au Bouchet. near Geneva, Thursday, August 8, 1805.

Coyne Brothers' Firm Change

The Chicago Packer contains the announcement that the firm of Coyne Brothers has dissolved, Mr. Dan J. Coyne selling his interest to his brother, Mr. Richard J. Coyne, who will conduct the business under the same name.

The firm of Coyne Brothers is well known to beekeepers, as they handle large quantities of honey.

THE EDITOR'S ANSWERS

When stamp is enclosed, the editor will answer questions by mail. Since we have far more questions than we can print in the space available, several months sometimes elapse before answers appear.

LARGE HIVES FOR COMB HONEY

Have you ever tried the Jumbo or Modified Dadant hive for comb honey, by taking out two frames from each side and placing a dummy of the same size as two frames in their place, at the beginning of the honey-flow and at the same time that supers are put on?

This would crowd the bees into the supers at the proper time and the frames could be replaced at the close of the flow. This might, however, cause swarming at a most undesirable time, when practiced on old colonies.

What do you think of this idea?

MICHIGAN.

Answer.—The method is good, but I would not make an invariable rule of how many frames to remove. The more brood the colony has, the more combs you may leave, for the reason that they have more bees and also because the queen, being more prolific, needs more room. In this way you will have less chance of swarming than if you make an iron-clad rule of removing an exact number of frames from each colony.

But it is certainly necessary to crowd the colony into a smaller compass just as Dr. Miller did when he reduced his two eight-frame colonies to one eight-frame. With our large hives you can make a better adjustment, according to the strength of the colony and the prolificness of its queen.

UNRIPE HONEY

1. Can honey be extracted while uncapped or still green?
2. If so, what steps should be taken to ripen the honey while in barrels?
3. Will honey extracted in this manner be of the same quality and flavor as honey extracted after being ripened in the hive?

NORTH DAKOTA.

Answers.—1. Honey may be extracted while still unripe or green. In fact a great deal of honey is thus extracted, and too much of it put upon the market in that condition.

2. Unripe honey should not be put in barrels, but should be kept in open tanks or vessels and allowed to evaporate. It may evaporate sufficiently if kept in a very hot spot. But it is usually necessary to use more or less artificial heat.

3. No, I do not think we can evaporate honey as efficiently as the bees can do it, because they use both heat and ventilation. If it was possible to keep our honey, after extracting, in an open vessel, at say 120 degrees, and give it a strong current of air at the same time, it would probably produce as good results as are secured by the action of the bees.

VALUE OF BEES

1. About what will a colony of bees be worth, the latter part of this month, hived in a single-story standard hive, metal cover, on combs drawn out from full sheets of foundation, wired?
2. What is the approximate price of an empty broodcomb (Hoffman frame) drawn out from full sheet foundation, wired?
3. What is the average charge for transfering a colony of bees from an old-fashioned box hive into a standard hive?

PENNSYLVANIA.

Answers.—1. The prices of colonies of bees depend upon several matters, whether they are in 8 or in 10-frame hive, whether they are common blacks, hybrids or pure Italians, whether the hives are new or old, whether to be packed for shipment or delivered on the spot, etc. The average price of bees, on the spot, with good queens, is about $8 for 8-frame and $10 for 10-frame hives. We ask $15 for 10-frame hives, pure Italians, packed for shipment.

2. Brood combs, all built of worker foundation are rarely sold, but would be worth about 35 to 50 cents each, according to their age and the demand for them.

3. We used to get $1 each to transfer bees from box hives to movable frames, transferring all the good worker combs and putting the hives in good order. The price must depend somewhat upon the number to be transferred and the distance to travel to do the job. It takes a man of dexterity to do a good job, kill no bees, and save all the brood, and have no robbing If it is done during fruit bloom it is very much the best.

RIPENING HONEY

There have been several different opinions about how honey is made, from the time the bees get it from the flowers until it is ready for use.

Please send me the full details of it.

ALABAMA.

Answer.—The opinion has been expressed right along that the bees evaporated the nectar of the blossoms, by creating a current of air through the hive, by fanning with their wings. But there is a new theory which claims that bees drop a part of the water by a digestive process which separates the sweet from the water, the latter being ejected. This matter is not fully settled. Dr. Brunnich had an extensive article on this subjuct in the American Bee Journal for February, 1919, page 56, and both he and Wallace Park discuss it in this number.

Of course there is also a change in the chemical property of the honey, by the action of the saliva of the honeybee. I could not describe this to you in a letter. Suffice it to say that honey differs in chemical composition from the nectar from which it is made. But each variety of nectar leaves the flavor of the blossoms in the honey, as well as a special shade of color.

STRANGE BEHAVIOR

On June 14 I had a small swarm, just enough to cover one frame. The bees were hived and given a frame of capped brood. Instead of going upon the frame they gathered in one corner at the bottom of the hive where they remained for three days, finally going up on the frame. The weather having been very cold, the brood had died during the three days mentioned. Promptly upon going up the bees began to clean out the cells containing the dead brood. Can you explain the action of the bees in not going up on the frame of capped brood immediately upon being hived? They have a fine queen.

NEVADA.

Answer.—No, I can't explain. It is one of those freaks on which men like Dr. Miller say "I don't know."

About the only explanation I could give would be that, perhaps, the queen got into that small corner and the bees followed her and did not go about enough to find the brood. They must be weak.

You did not ask for advice, but let me suggest that, if you want to save that colony and that fine queen, it might be well to give them a few young bees and a little brood from some other colony.

EXTRACTING NEW HONEY

As the white clover honey flow has been about over for a week or 10 days, and uncapped honey on the hives during that time, would it be safe to extract it before being sealed?

Iowa.

Answer.—Yes, honey that has been on the hive for a week in hot weather is sufficiently ripened, even it it is not sealed. In fact, it might be even more ripe than honey that was harvested and sealed by the bees in a hurry, as sometimes happens. We have seen such honey ferment and burst the cappings.

SUPER FOR SWARMS

I have several new swarms (hived this year) that are very strong now. I hived them on full sheets of foundation (Dadant's wired foundation). They drew out all 10 frames, and most of them contain brood. I am running them for extracted honey. How would you give them a super? Could I place it on top of brood chamber, or raise brood chamber and place empty super underneath? Confining queen with one frame of brood and placing queen excluder on top? I have the Langstroth equipment using all deep extracting supers.

WISCONSIN.

Answer.—I would place the super on top of the brood chamber. Those new swarms are not likely to swarm if they have plenty of room, and at this time of the season, it is not necessary to induce the queen to breed more plentifully, if she has a hive full of brood already.

However, if you are afraid they will swarm, you might use the Demaree plan and raise the brood to the super. But I am not in favor of it under the circumstances.

INCREASE, SWARMING, POLLEN, ETC.

1. What is the best method to adopt to make increase and not affect the surplus?
2. What is the best method to control swarming?
3. If a colony is affected with foulbrood what is the best treatment to give them to eradicate the disease?
4. If frames of pollen are removed from the bees for winter, about what time should they be returned in spring?

WASHINGTON.

Answers.—1. No method exists that will enable you to make increase that will not affect the surplus production. However, if your main crop comes in the latter part of the summer, say August or September, and if you have enough crop in June to enable the bees to breed plentifully, you may make it advantageous to increase your colonies, because you will have so many more colonies when the late summer crop comes.

Otherwise, the way in which the making of increase will have the least influence upon the crop will be by making the increase from colonies that breed too late for their bees to take advantage of the crop, or colonies that have a large amount of brood when the crop is on, but not a very large number of field bees. It is necessary to remember that bees which have been produced later than 20 to 35 days before the full honey crop are too late to help secure much honey. These bees may be used for increase without much damaging the result in surplus.

2. To give methods of swarm control would take several pages. You must read up on that subject. Remember, however, that there is no method in existence that will give you entire control of swarming.

Young queens, few or no drones, plenty of room in both supers and brood chamber, ventilation and shade are the main requirements.

3. The treatment of foulbrood also requires a number of pages for its description. It cannot be given in a few words.

4. It is almost impossible to remove combs of pollen from the hives in the fall without also removing a great deal of the honey. But if you have removed combs of pollen and have kept them in a dry place so that the pollen is still good in spring you had best give those combs back to the bees at the opening of spring when they begin to breed and before the flowers give fresh pollen. The date of this must depend upon the location you inhabit. (I would not remove extra pollen for winter but leave it with the bees for use for early spring brood rearing.—F. C. P.)

MOVING BEES

I wish to remove a small apiary of about 25 stocks from England to Ireland; this entails a road journey to station, a rail journey to port, a sea journey and then another rail and road journey.

What is the best method of doing it? Should the bees be shaken from the combs? Should I do the transfer some time between October and March, and send them loose in a box, and the combs separately? If so, should any frames or other material be put in the box with the bees, for them to cluster on the frame, or should the bees be just sent loose in the box, with the queen caged? What food should be given for the journey, and should it be syrup or candy?

IRISH BEEKEEPER.

Answer.—If you do not transport the bees in warm weather, there will be very little risk to run in transporting them, with all their combs. Doing it at some date between October and March, you may select a time when there is but little brood, say late in the winter.

Have the combs well fastened down. Then place over the brood chamber a wooden frame supplied with a screen in about half of its width. Ship the covers and supers separately. If it does not require more than a week for the transfer, you should get them through without any loss. If the weather is cold, they may need but very little ventilation.

Shipping the bees separately would entail more risk, for it would be more difficult to supply them with food, unless you placed them in regular shipping crates. The removal of the bees from their hives and returning them afterwards would also be much more work without compensating benefit.

KIND OF HIVES

1. Which is the best hive for extracted honey—the 10-frame, the Jumbo, or Dadant 11-frame?

2. Which would be the cheapest in the long run? I winter my bees in the cellar. Our main honeyflow is white clover, some basswood, and goldenrod in fall.

3. Are there very many M. Dadant hives sold?

WISCONSIN.

Answers.—1. We much prefer the Dadant hive for honey production, especially extracted honey.

2. If you want plenty of swarms, you may find the Langstroth 10-frame the cheaper. But if you want to produce honey mainly you will probably want the larger hive. We would not accept the smaller hives as a gift, either for wintering or for honey production, after using both side by side for fifty years. We would not keep any L. hives at all if it were not that the trade demands bees in that style.

3. The number of M-D hives sold is small, not over 10 per cent of the total. We sold some 600 of them last year. We have never cared much whether they are in demand, but we know what we want for our own use.

PLANTING FOR SCREEN

What can you advise for planting as a screen to protect persons and animals from bees? Would prefer something that is useful, either as food from garden or useful to the bees or both. I have been using sunflowers. Their chief objection is the necessity of planting a succession, and, too, they are not quite early enough.

DELAWARE.

Answer.—We have never had occasion to plant anything to screen anything from the bees of an apiary. But I believe that, if it was necessary, I would plant bushes and trees. A row of gooseberry bushes, close together, and a row of cherry trees just above the gooseberry bushes, should protect pretty well, and they would give, at the same time, flowers for the bees, protection for passers-by, and later, fruits.

A chicken fence 12 feet high, with meshes an inch or smaller, is a very good protection against flying bees, because when on the wing the bees do not try to fly through such meshes, and I have seen it used successfully. But, right in front of the hives, the bushes will certainly be a more positive protection.

BARRELS FOR HONEY

1. Can you tell me where I can get good hardwood barrels which would be satisfactory for storing honey?

2. Would beeswax do as well as paraffine for coating the inside of barrels?

Any particular advice you can give one who has had no experience in storing honey in barrels will be appreciated. I wish to keep a supply of honey stored for the "lean years." Tin containers rust and will not answer that purpose.

MISSOURI.

Answers.—1. Good, alcohol barrels, already coated, and which have been used once, are suitable. We buy them from druggists, especially manufacturing druggists, who use large amounts of alcohol in medicines. They may be had in any large city. We have bought also from a cooperage company: The Brueckmann Cooperage Co., 2415 South Third street, St. Louis.

2. Beeswax is not so good as paraffine for coating barrels, because it melts at a higher point and therefore hardens more quickly and is apt to be too thick and peel off. By putting the barrel in the hot sun for a few hours, heating the paraffine very hot and pouring out what does not stick, you can get a light coat of it in the barrel, but it is still better to buy already coated barrels.

You will find barrels better than tins, when it comes to keeping honey several years.

REQUEENING

1. I have had more or less trouble in the past in introducing queens in the mailing cage.

In answering England about introducing queens, in the April issue of the American Bee Journal, you say to put the queen in a cage and put her in the hive for 48 hours, and the bees will accept her.

The way I understood your answer is as follows:

Take the queen out of the mailing cage, presumably by a window, and as she runs up the glass hold the little wire cage so that she will go in, leaving out the bees that have accompanied her. Then put the cage containing queen on top of the frames in the hive for 48 hours. As the queen is alone, I take it after a certain length of time she will beg for food and the bees in the hive will feed her through the wire netting. When the 48 hours are up, I look into the hive, lift the cage, take out the wood plug in the end of the cage and with a dab of cappings and honey taken from the nearest frame close up the plug opening again and close the hive. When the bees have eaten their way through the cappings and honey, the queen will have become familiar with them and will not run, and they will accept her.

Is my interpretation right?

2. Not being very expert with bees, it seems to me I will have some trouble getting that queen out of the mailing cage into the introducing cage.

3. Another thing is, after I have safely hived her for 48 hours, I know that that little cage will be covered with bees when I open the hive. Will it do any harm to smoke them off so as to take out the wood plug and stop it up with honey, or will it undo the work of introducing so far accomplished by frightening both the queen and bees?

4. My queens are two years old this coming August and to get rid of the trouble of requeening in August when there will probably be 3 or more supers on, I want to requeen this spring. We have no honey flow here until fall, and I think spring is the time for new queens.

5. I have a story and a half (brood chamber and extracting super) on hive being what I wintered the bees in. Should I put the queen caged on the top super?

NEW JERSEY.

Answers.—1. Yes, you understand the question correctly, but instead of putting the cage containing the queen "on top" of the combs, I much prefer to put it between the combs, right close to the brood. A queen in normal conditions belongs on the brood combs and not away from them or above them.

2. It is not absolutely necessary to take the queen out of the mailing cage, but we prefer not to have any of her bees with her, because, sometimes, the bees of the colony are willing enough to accept a strange queen, but unwilling to accept strange bees. But whether you let the bees go out of the cage, or get the queen into a different cage matters little. It is not at all difficult to get a queen when you let her out on the window. We had to do that for all the queens we used to get from Italy, because they came in regular miniature hives, with two combs and some 40 or 50 workers. We never had any trouble.

3. If you find the cage covered with bees you may lift it out to remove the stopper. When using the little flat Miller introducing cage we used to fasten it to a small wire, and let it down between two brood combs. Then when releasing the queen we would lift it out to do the work of removing the stopper and let it in again. I do not believe in smoking the bees that are on the cage. I want to leave them on, unless they show anger. In the latter case, there might be trouble in releasing the queen then.

4. If my queens were only 2 years old this coming August I would not replace them until after that date, or next spring, because, in my opinion, queens are best at their second laying season. But since so many people disagree with me on this, I will not insist on it.

5. I would certainly not put the introduced queen as far from the brood as the top super. Even if it is a little more trouble, I would put the cage between two brood combs.

Whatever you do, make sure that your bees have plenty of food when you introduce a queen to them. Be sure, also, that there are no robbers about when she is released. That is why we do not release her entirely when opening the hive, and that is also why we leave the hive without examination for 3 or 4 days after she has been released.

CAN THE BEE-FORAGE BE IMPROVED IN AMERICA?

By Alois Alfonsus.

IN many European countries bee culture yields only a moderate income. The average yield of a colony of bees in a year is admitted to be only about twenty pounds, though this amount is not always obtained. There are too many off years.

Since the year 1917, my native land, Austria, for example, has not recorded any full honey crops. The circumstances are that, though in general agricultural methods have improved, the honey yield from the bee colonies has declined. The weed eradication campaign decreased the honey crop. The cleaner the fields from weeds, the less the bees obtained from them. In that land the bees obtain the most of their honey from trees.

Clover fields are to be found in only a few localities. However, where the white clover, alfalfa and sainfoin occur they are worked on. The expansion of these was very noticeable as soon as the beekeepers bestirred themselves to increase the forage for the bees.

Many associations are developing an extraordinary interest and brisk activity in this. Trees and seeds are secured, which the young lady beekeepers prepare and gratuitously distribute to those who are willing to plant and care for them. Clover seed is distributed to farmers, especially, by those who without charge give large amounts of sainfoin seed, in order to introduce this important honey plant into localities where it is as yet unknown. This has produced the best of results. The ensuing honey yield has paid well for the seeds and amount expended; besides, it is resulting in the introduction and naturalization of the kinds of clover most important to bee culture, in these regions.

Almost everywhere, in all lands and countries, the honeyflows are charted. Every beekeeper knows the time for the main flow and likewise the times of dearth. People everywhere now bestir themselves because of the plowing under of good nectar-bearing plants at the time when they bloom, when the bees have not secured abundant stores of honey. Attempts to improve the bee forage have been made in many places, with wonderful results therefrom.

When I came to Minnesota I was delighted by the good spring forage, which effected a rapid building up of the colonies. The apple blossoms and the dandelions yielded so abundantly that it seemed to me nearly 1000 pounds of honey would come from them. But there was an almost complete cessation of the nectar flow for nearly three weeks, until the white clover (**Trifolium repens**) began yielding nectar. This continued then for fourteen days, until the commencement of the real heavy nectar flow from the linden and sweet clover. The month of June, during which the main nectar flow occurs in most European countries, is less favorable here in the northwest.

Still now it may be possible, without a great expenditure of means or trouble, to transform this month into one with a good nectar flow. In Hungary, from May 20 to June 5, the blossoms of the black locust (**Robinia pseudo-acacia**) furnish the principal nectar flow, and it is so copious that extracting has to be carried on during the same. The beehives there are not capable of expansion as are the American hives. Storage space must therefore be provided through the removal of honey.

Although the black locust is native to America, it was introduced into Hungary about 150 years ago, where today it is the widest disseminated and most valued tree. The wood of the black locust is very valuable. It is hard and tough. From it are built wagons; it is well suited for mine timbering, being the best kind of wood for this; for implement handles it is excellently adapted, also as fuel. At the same time, the tree is very modest, succeeding in any kind of soil and enduring the most rigorous winter cold. The black locust is quick growing and may readily be raised from seed, but it can also be propagated by means of cuttings, as are the willows (**Salix**).

If a beekeeper would raise a thousand little locust trees from seed and when they are two years old present them to the farmers of the neighborhood where his bees forage, he would prepare for them a most wonderful source of nectar to work on at about the beginning of June. Under these circumstances the black locust makes a very rapid growth and blossoms in a few years.

With us in Austria the locust blossoms appear earlier than the leaves. The blooming trees look as though they were loaded with snow. In my native land the summer linden (**Tilia grandiflora**), also called large blossomed linden, blooms from June 5 to 20, immediately after the black locust. If it were introduced into America also, a very substantial prolongation of the linden nectar flow would result. Directly after it the winter linden, called also pure linden, blossoms. These would extend their periods of bloom up to that of basswood. The most highly prized linden blossoms are those of the Hungarian silver linden, which open their fragrant calyces to the bees just after the blossoming of the American linden.

Through the systematic planting of the species of lindens named, the bees would be afforded a full two months linden flow. How this would

enrich the June flow! Seeds of these species of linden can be secured from one of the forest-seed dealers in Austria.

I have already ordered large quantities of seed of the black locust and summer and winter lindens; besides, an attempt at growing them in a small way this year was most successful. In the course of the coming years I hope by means of them to produce a substantial improvement in the honey yield during the month of June.

The excellent nectar-bearing sainfoin will also be given a trial here. This yields honey equal to the best from all kinds of clover known to me, and yields it in very large quantities where large fields of it are grown. It is sown with small grains, oats and barley being among the best to plant as cover crops. It begins to bloom toward the end of May the following year, and about the middle of June there is a genuine full nectar flow for the bees.

Even if very good average yields do prevail in the United States, still it cannot be said that the same cannot be still further improved by the beekeepers. That this is possible has already been demonstrated by several of our associations in Europe. Twenty acres planted to sainfoin furnish enough honey to fill our hives by early June.

Why shouldn't we make an effort to overcome the nectar dearths by the planting of good nectar-yielding plants to fill in these intervals? The costs are trifling, the results great. Why should there not be an abundant yield of nectar during June, in the states of the northwest.

In Vienna the tree of heaven **(Ailanthus glandulosa)** yields the most honey. It blossoms about the fifth of June and continues for fully three weeks. But as this tree freezes easily while it is young, the bringing of it into northerly regions is out of the question. But in Illinois, e. g., it thrives very well, as during my sojourn there I saw pretty old specimens of it. This tree, originally from China, propagates itself very quickly through the flight of its seeds, if there but be a few specimens of it at hand. In Vienna there are ten thousand "trees of heaven" **(Ailanthus)**, which produce nectar abundantly. We have had this yield for thirty years, because the tree of heaven propagates so rapidly. It is exceptionally quick growing, a two-year-old tree being as tall as a man. When five or six years old the tree commences blooming. The blossoms are small and of a greenish color. They are born in upright panicles. Since the blossoms do not all open at the same time the yield continues oftimes for three entire weeks. In the milder regions where the June nectar yield is not entirely satisfactory the same can likewise be very substantially improved by means of it.

The honey from the back locust is bright yellow to water-white and of a fine aroma. The honey from the

sainfoin, which blossoms at the same time, while at first somewhat darker, resembles sweet clover honey in color. The European linden honeys resemble the American basswood honey, they likewise having a weak. greenish tang. The honey from the tree of heaven is green and has a fine, strong aroma. Professor Dr. Zander includes it among the best of honies. There is therefore no danger that the importation and dissemination of the honey plants mentioned would in any way impair the quality of North American honey. To the contrary, I believe they would improve it.

In Europe the beekeepers are mastering the difficulty of improving the bee pasturage. In America it ought to enhance the prospects for the better development of bee colonies and higher yields. The greater income thus obtained would richly recompense the increased expense and work.

(The sainfoin recommended by Mr. Alphonsus is the **"Onobrychis-sativa"** of Europe, one of the very best hay plants in existence. Its name, "sain foin," is composed of two French words which mean "healthy hay." It yields the very best grade of honey known. Why it has not yet been tried in different parts of America is a question. Perhaps it has been tried and failed.—Editor.)

SMOKER FUEL

By Clay Lyle.

Having read the article by Professor Paddock in the April issue of the Journal in regard to corncobs as smoker fuel, with special reference to the length of time this material would hold fire, I would like to mention another fuel which possesses this quality to a marked degree, namely, planing-mill shavings of long-leaf yellow pine lumber.

I have filled a smoker with this fuel and had it to burn continuously for more than nine hours without recharging, though, of course, it was used very little during the time. However, it was constantly ready, and only a few preliminary puffs were necessary to make it produce volumes of thick smoke with a rich pitchy, resinous odor, very pleasing to smell. I have not compared this fuel with shavings of other species of pine, but it is very superior to cypress or gum shavings.

It is by far the most desirable fuel I have found, especially for use in making inspections for foulbrood in small apiaries, as the smoker remains lighted in going from one place to the next, and no time is lost in starting the smoker at each new place. Where a dozen or more small apiaries are inspected during a day, this saves considerable time.

While the long-leaf yellow pine belt contains only a small percentage of the beekeepers of the country, it is possible that some of them have never tried this excellent fuel.

Buckeye Poisoning

There has been considerable complaint on the part of California beekeepers concerning a bee malady which has come to be called "buckeye poisoning." An effort is being made on the part of the University of California and the State Beekeepers' Association to get together considerable data on this problem. Certain experiments are in progress in this connection.

Will you co-operate with us to the extent of writing answers to the following questions? Any other information from your experience will be appreciated.

How prevalent are buckeye (horse chestnut) trees in your locality? Do they occur mostly in spots on certain exposures?

How often are bees seriously affected by the malady? Are they affected more or less every year?

Will you describe the symptoms as observed by you personally?

Have you any suggestions for the elimination of this trouble from the apiary?

G. H. Vansell,
Davis, California.

QUEEN INTRODUCTION

The article by Mr. Gilbert Barratt, page 182, April A. B. J., contains a valuable paragraph regarding queen introduction as practiced by S. Simmins. This system has been uniformly successful with me. I cannot recall a single failure, but I have never had the nerve to try it on a high-priced queen just out of the mail. It is one thing to introduce a fresh queen, heavy with eggs and strong with the laying odor; it is another thing to introduce a flighty little thing, fresh out of the mails. At least that has been my experience. We do not use the Simmins method just the way Mr. Barratt does it; we do not disturb the queenless hive. When we requeen, we kill the old queen, some time in the afternoon or evening, then cage a queen from a mating hive without attendants, keeping her there for about half an hour. You will find the bees of the queenless hive, by this time, running all over the front of the hive, as though they had lost something. We then take the cork out of the cage and lay cage and all on the lighting board. It is a case of love at first sight (or smell) all around.

As Mr. Barratt says, "simple, isn't it?"

Charles Bowden.

Ontario.

A New Organization

The beekeepers of Avoyelles Parish, Louisiana, have recently organized an association. Many of the members are engaged in shipping package bees to the North and the first object of the organization is to permanently eliminate foulbrood from the parish. To attain this end the State Entomologist appointed Mr. Lott, of Marksville, a local inspector, with instructions to destroy by fire all colonies found to be diseased. It is further arranged that any apiary in which disease is found will be quarantined until time enough has passed to insure that the apiary is clean.

Jes Dalton is president of the new organization, L. C. Mayeux vice-president, and N. J. Beridon, Jr., secretary.

More Radio Talks

E. W. Atkins, of the G. B. Lewis Company, has been announced for several bee talks by radio. There were two such talks from Chicago on June 24 and others were announced for July 18 and August 15, from Station W-L-S, Chicago.

"Just Bees"

The March number of Railway Life contains an article on bees, under title as above, by John Protheroe, whose name is well known to our readers. It is given over to a popular story of the life of the honeybee. It is written for the purpose of interesting the readers of that magazine in bees and honey, rather than giving information to railway men as to the proper care of bees in transit. Stories of this kind will do much to remove the prejudice common to the mass of the people and be helpful in stimulating a demand for honey on the tables of the readers.

RIDDING A BOX-HIVE OF BEES

By Daniel E. Robbins.

When in Tennessee in 1864 as a member of the Seventh Illinois Cavalry, one foggy morning, with a light rain falling, it occurred to me that some honey would be a fine addition to our rations. As I was riding past a stand on which a tall, slender box-hive stood, I lifted it over my thigh, with the open end to the rear, and started my horse at a sharp trot around a field. On looking back I saw a cloud of bees pouring out, but none knew what to do, and after about half a mile ride there were very few bees left on the combs and those were not inclined to make any trouble, and my mess had honey to eat and share with our comrades. This method is not recommended for general use.

SHOOTING DOWN A SWARM

As swarming time is here, it may be that the little experience I had with a swarm that it was next to impossible to get will be of help to some brother beekeeper.

Going out in the apiary one day, I discovered a very fine swarm hanging on the end of a large walnut limb about thirty feet from the ground and about twenty feet from the body of the tree. Sawing the limb off meant spoiling the looks of the tree; besides, it would have come down with a crash, making the bees very angry and probably killing a lot of them. The limb, where it joined on the tree, was about eight or ten inches through; so that idea had to be given up. But I wanted that swarm mighty bad, though I felt a little like the fox about the grapes: "You're nothing but old black bees anyway."

Then the idea popped into my head that I might shoot the limb down with a load of shot from my Winchester. The weight of the bees bent the limb so that it was about ten inches from the upper limb to the swarm. I got a hive and put it as nearly as I could below the swarm. Then, putting four stakes in the ground about four feet apart, I went to the house and got one of the missis' sheets, and tied it to the stakes.

Taking the gun, I stepped back a few paces and fired. The trick was done; they fell plump in the sheet. I loosened the ends of the sheet nearest the hive, and the bees did the rest. They were all in the hive within a few minutes and not a dead bee to be seen.

Most beekeepers have guns. Don't spoil a nice tree or risk your life. Don't let them get away, either, but shoot them down. A good swarm is worth $10 to $20 in honey if they are cared for and given plenty of surplus room. Three or four colonies will produce all the honey that a family can use. I have had bees store from 50 to 300 pounds per colony, where they were well cared for and did not have to suffer during the winter.

I have kept bees for thirty-four years and had eight years' experience with Dadant & Sons. That was where I learned to keep bees successfully.

Frank Lefler.

Smoker Fuel

Cut gunney sack or burlap into pieces of a size to make a short roll to fit the smoker. Dip these rolls into water and let them dry; this will cause them to remain rolled. This makes an easily lighted fuel, although it leaves some creosote. Dump what remains at the close of your work into a tin can and put on the lid. This will quickly extinguish the fire. When starting fire again the partly burned pieces are easily lighted at the charred end. Rolls should be fairly tight to avoid burning too rapidly.

O. H. Ford, Indiana.

FOLKS WORTH WHILE

A. D. Worthington.

SOUTHERNER GOES NORTH

A. D. Worthington grew up on a big plantation in Mississippi where beekeeping was conducted along with cotton growing. The Worthington apiary was a good one and its owner one of the leading beekeepers in Mississippi. At the Mississippi College of Agriculture young Worthington was an outstanding student and was soon employed as an inspector under the State Plant Board, which includes bee inspection along with its other activities. We next hear of him as a teacher in the Southern Institute of Agriculture at Greensboro, Alabama, and while connected with that institution he did some inspection work also.

When a vacancy occurred in the Iowa beekeeping staff, Worthington was selected for extension teacher of beekeeping in that state. He is now kept very busy looking after the many demonstration apiaries scattered over the State of Iowa, and in addition finds time for lectures at institutes as well as an occasional trip for service as an inspector. Worthington has touched beekeeping at many points and his wide contact both north and south helps him in meeting the variety of problems which an extension man is daily called upon to meet.

IOWA TO TEXAS

Dr. Charlotte Strum found the summers too short and the winters too long in the North, so she moved to San Antonio, where summer prevails for most of the year. Doctor Strum found her professional work somewhat exacting, and in looking about for a hobby to take her into the open air, decided than an observation hive was just what she wanted. She soon became so much interested in the activities of the bees in the little glass hive on the porch that she bought some bees in an honest-to-goodness hive and set out to get some real honey. From a small beginning she gradually increased her beekeeping interests until she has become a partner in the Sunny South Apiaries, which now operate about 800 colonies of bees in the vicinity of San Antonio.

While the doctor still continues her practice, the bees claim a large part of her interest and she regards it as a personal misfortune when any of her patients chance to be sick on the days set apart for beekeepers' meetings. Doctor Strum never attempts to cure a case of "Bee Fever," in fact she argues that "Bee Fever" is a good cure for some of the commoner diseases of mankind.

Dr. Charlotte Strum

LEAGUE TRAFFIC BUREAU STARTS WORK

Transportation Committee Has a Big Field—Adopts Conservative Policy

A. G. Woodman, chairman of the newly organized transportation committee of the League, has begun the study of freight and express classification of honey and bee supplies. He and the other members of the committee, F. W. Sommerfield, of Ohio, and D. H. Hillman, of Utah, realize they hold one of the most important and responsible positions in American beekeeping.

Through correspondence, Mr. Woodman has already secured agreements from most of the large honey shippers of the United States that they will give full co-operation and support. The settled policy of the committee will be to present only the most legitimate and worthy claims.

Freight Classification

The first work of the committee will be to secure a lower classification for granulated than for liquid honey. Later in the summer or early fall, samples of granulated honey will be secured and an application made for a hearing by the Interstate Commerce Commission.

"If a reduction in the classification of granulated honey can be secured," says Mr. Woodman, "this will mean a saving of many thousands of dollars in freight charges each year. If the American Honey Producers' League never accomplishes anything more than this it would be well worth the liberal support of the beekeepers and allied interests."

The following extracts from a letter from Earl C. Reed, Ranchester, Wyoming, gives an idea of some of the work before the transportation committee and how they must study the freight classification.

Replying to your letter of the 28th ult., I have just consulted the current issue of 'Consolidated Freight Classification No. 3' and find the difference in classification between honey jars and jelly jars or glasses has been corrected, so we have an equal rating of third class.

"However, I would like to call attention to the following L. C. L. ratings, which are for shipments from the 'Western' area, and hope they may be of some help to the Transportation Committee. Comb honey in wooden boxes in paper cartons first class, in wooden boxes only, double first. There is discrimination against the western beekeepers, where most of the comb honey comes from, as in the 'Southern' territory the former is second class. Comb or strained in wooden boxes, second; in metal cans completely jacketed, first; in metal cans boxed, third. For comparison, syrup not medicated N. O. I. B. N. in glass or earthen ware packed in barrels or boxes, fourth; in metal cans

completely jacketed, fourth; in metal cans or pails in barrels or boxes, fourth. Note how liberal the caption, this includes maple syrup, which is higher in price and lighter in weight per gallon, therefore taking more cubical space in a car. Honey granulated in boxes, second; maple sugar in barrels, boxes or pails in crates, third; beet or cane sugar in single or double bags or boxes, fourth. Consider how much more liable to damage a sack of sugar is from absorption, or tearing on a nail, than a 135-pound case of honey in tin, besides being a little more bulky. For comparison on comb honey, would like to mention window glass, not bent, packed in boxes, third class.

"I presume the classification board stuck up comb honey on account of being fragile. It surely is no more so than glass, and carries no higher invoice value, but it isn't made by as large a trust. Some reduction in rating should be made on tin containers, on the grounds that they are handled twice, once empty and once loaded, and where handled through a jobber this is doubled, yielding the railroads four profits, who in preparing their propaganda to hoodwink the public in their endeavor to explain away the present extortionate rate, only quote the last haul on the finished product, and they are getting by with it with the majority.

Attendant with Bees

Frank Rauchfuss, manager of the Colorado Honey Producers' Association, calls attention to the fact that: "There is no rule allowing the transportation companies to permit an attendant to go with one or more cars of bees, to look after them in transit, unless full fare is paid. You are perhaps aware that with a car of emigrant movables, which brings only perhaps one-fifth of the revenue to the carrier that a car of bees would, one man is allowed free transportation one way, provided said car contains one or more head of livestock. It therefore is only a fair proposition to ask the railroads to permit one man free transportation one way in charge of a car of bees, and we believe that this is a matter that could be obtained comparatively easily, provided the League, through its bulletin, will bring out some of the subjects which the Transportation Bureau of the League could undertake, if it had the financial and moral backing of the beekeeping interests of the country."

Careful Packing

We recently had some correspondence with Hamilton, Wallace and Bryant, of Los Angeles, relative to the desirability of having **all** extracted honey put up for shipping by freight or express packed in substantial wooden cases with a partition in the center, said partition to be nailed in. The specifications for a good case to ship 5-gallon cans in are, that the ends as well as the partition in the center, are to be seven-eighths inch thick, and the bottom-board, sides and top are three-eighths inch or better in thickness.

The members of the Colorado Honey Producers' Association have been instructed for some years past to use such a case for the packing of their honey. It would certainly be desirable to get some uniformity in the way of can cases, as the California shippers, as well as others, are complaining about the flimsy cases that some beekeepers are using, and they are stating that in the future they will refuse to buy honey not packed in partitioned cases as long as they can get some that is packed in the regulation partition case.

Traffic Bureaus Valuable to Other Associations

A survey recently made by the La Salle Extension University showed that traffic committees are successfully serving both large and small organizations, whether in single communities or scattered over a wide area. The survey points out clearly that trade associations have recognized the value of co-operation in traffic as well as in other matters; whether their membership is composed of producers, manufacturers, wholesalers or retailers; whether they deal in the products of agriculture, mines, forests, animal industries, or a variety of commodities; and, whether they are national, sectional, state or local in the scope of their activities.

We believe that the new transportation committee will be one of the most valuable activities ever undertaken by a beekeepers' organization.

Some New Notes

The secretary visited several of our western members from the Rocky Mountains to the Pacific coast last month and found interest in the League everywhere. California seems to be "out of luck" again, as the late rain will again reduce their crop to a fraction of the normal amount.

H. E. Hutchison, of Hotchkiss, Colorado, has a patent for a new and promising honey sales device. It is a large glass container from which the honey is drawn into paper cartons for each purchaser. The liquid honey, clean and in full view, makes a strong appeal to people with a "sweet tooth."

F. B. Paddock, superintendent of the Honey Products Department of the Mid-West Horticultural Exposition, anticipates a large number of high-class entries. The exposition will be held at Waterloo, Iowa, from November 11 to 16, 1924. Premiums total $600, exclusive of a liberal number of special prizes.

The New York State Marketing Association, through their agent, has made arrangements with a successful honey-selling organization to canvass from house to house the entire city of Brooklyn, N. Y., with Blossom-

sweet Honey, according to R.B. Wilson.

Frank Hill, Sabatha, Kans., writes that he intends to try marketing "canned honey" this year. The honey is to be canned in gold and pink cans, sealed and then heated. The advantages are said to be lower freight rates, smaller tin containers, and reduced danger of breakage.

League Nationally Organized

For two months new memberships and renewals have been pouring in to the secretary's office. It is a poor day when anywhere from half a dozen to twenty new names are not added to the League roll.

Every state in the Union is now represented except Delaware and South Carolina. A race is now on between those two, to see which will be the first to join with the other forty-six states.

Beekeepers are deciding they no longer want to be left out in the cold.

Trade associations in the United States have increased from 800 to 1,800 since 1914 and any trade which wishes to survive must form a united organization to look after its interests. Activities of trade associations include such matters as the compilation and distribution of statistical material relative to their industries or trades, the simplification and standardization of products, the establishment of uniform cost accounting systems, the adjustment of trade disputes, and the promotion of industrial and commercial research. Other activities of trade associations deal with employee relations, government relations, public relations, credit and collections, transportation, and insurance. Some associations have successfully undertaken numerous lines of activity while others have concentrated upon only a few.

That the work of the League appeals to all sections of the country is shown by the widespread membership list. The five states having the largest lists are, in geographical order: New York, Michigan, Wisconsin, Colorado and Oregon.

Two of these states (Wisconsin and Colorado) have over a hundred League members apiece paid up for 1924 and Michigan's list is expected to be even larger as soon as the next check is received from the state secretary.

In the South the greatest interest is shown in Texas, Missouri, Alabama, California and North Carolina. Each of the others, however, has from two to half a dozen beekeepers who believe in combining forces to secure results.

As B. R. Clement, of LaSalle Extension University, says, "The trade association is an economic factor of increasing importance in the business life of the country. An outgrowth of the 'guild merchant' of medieval times, the modern trade association, through several stages of development, has become a substantial business organization, which not only promotes the interests of its members,

but also renders valuable assistance in the industrial and commercial progress of the country.

Every beekeeper who has faith in Honey Production as a permanent, substantial industry should be a member of our trade organization, the American Honey Producers' League.

Hundreds of Slogans

Three hundred and sixty-six honey slogans were turned over to the advertising committee on May 15, when the contest closed. The committee, with the assistance of an advertising expert, is working on the list at the present time.

If a satisfactory slogan is found, it will be announced in the next issue, and the lucky proponent will be sent a check. If the committee thinks none of the suggestions will do for a nation-wide business covering a hundred million pounds of sweets, we'll try again.

We have that prize money salted down ready for use, and we're anxious to send it to somebody. We hope you've satisfied the committee this time. If not, we'll give you another chance.

CHEERFUL NEWS FROM A CHEERFUL MAN

Mr. S. W. Mace, of Indiana, writes us:

"It is good that we can raise bees and produce honey. But what is more pleasant than to dispose of the honey at a good price? For the last 17 years I have sold all my honey except one sale to a wholesale house. I first peddled with a spring wagon, from house to house. Later I bought a Ford and went to more distant places. As the season progresses I sell at auction sales. I put up my honey in pint and half pint fruit jars, for the stores. If it granulates and they have difficulty in selling it, we take it back and melt it for them. For the retail trade I put it up in 5-gallon cans, 1 gallon cans and 5-pound pails. I sell the comb honey either in single boxes or in cases.

"When I talk honey to customers, I make their mouths water; I delight in selling, and I feel that the man who goes on the road is the man who wins. It pays to be of good cheer and pleasant, never giving up, even when things don't go well. If you have determination to win and be of good humor, you are sure to win. I not only sold my honey but I bought the honey of others for sale. The best time to sell in private houses is when the men are home from work, at noon or in the evening. I have sometimes sold more honey in the evening than in the entire day.

"I also have a sign 12 feet long with the words 'Honey from the Honeybee' at my home and a beehive on a post at the cross-road."

Mr. Mace also sends us the following clipping from a local paper in Elkhart County:

"The bee inspector in Elkhart County, under the direction of a representative of the State Department of Entomology, Mr. T. C. Johnson, has been carrying on for the past two weeks, with the result that practically all of the apiaries in the county have been inspected. This is the first time that complete bee inspection has been given in Elkhart County, with the result that practically all disease in the diseased sections has been destroyed.

"The credit for obtaining this inspection is due in the main to Mr. S. W. Mace, of Middlebury, and Mr. W. H. Mayes, of Goshen. Both Mr. Mace and Mr. Mayes spent several days with the inspector, taking him to the many apiaries in the county. County Agent Jackson also spent several days on the inspection tour.

"Mr. Johnson stated, when he left, that he found in Elkhart County the finest spirit among the beekeepers that he has ever found in any county. He found a class of beekeepers who were more than anxious to do their part in cleaning up the dreaded foulbrood disease. Mr. Johnson paid the beekeepers of Elkhart County a great tribute along this line."

Wax Importations

Beeswax importations are becoming less as the months go on. Evidently European conditions are such that the beeswax from Africa, the West Indies, and other far distant points is seeking the European markets again.

The reports of the Department of Commerce show that there was imported into the United States during February, 1924, 233,000 pounds, with some 581,000 pounds imported during the month of February, 1923.

Imports are growing smaller in this commodity, as is witnessed by the fact that foreign beeswax is quoted at equally as high prices as domestic.

We seem, therefore, getting back somewhere near normal in the distribution of beeswax.

Queen Introduction

May I add to my article on "Queen Introduction" in the April issue of the American Bee Journal, and at the same time reply to your footnote, by saying that I have imported very many queens from all parts of the United States, and have always introduced them by this method, with invariable success. Some of these queens have been in the mails three weeks, but the result has always been the same. If a queen has arrived in very poor shape, I sometimes cage her on honey for 24 hours, and then remove her and introduce direct later. Gilbert Barratt.

Maryland Officers

The following officers of the Maryland State Beekeepers' Association were elected at their last meeting, held at the Hotel Rennert, Baltimore, Md., Saturday night, March 15:

E. A. Andrews, Jr., President.

Harold L. Kelly, Vice-President.

Dr. J. R. Abercrombie, Delegate to Farm Bureau Federation.

Ernest N. Cory, Secretary-Treasurer.

Bee Hospital-Yard Founded in Vernal, Utah

A "district hospital-yard" for bees has been established in the Ashley Valley district near Vernal, Uintah county, Utah. The hospital will be in charge of the county bee inspector. Owners of hives infested with foulbrood or other form of contagious disease among bees will be asked to take them to the hospital, where the hives and the honey frames will be disinfected according to the most improved methods at a nominal charge to the beekeeper. It is expected that, with the more efficient method of handling, the district will soon be cleaned up of all bee infection.

It is the plan, according to D. H. Hillman, state apiarist, to have such a hospital for bees established in every beekeeping county in Utah.

Massachusetts Regulations

New regulations have recently been issued by the Massachusetts Department of Agriculture which require any beekeeper in that state who finds disease in his apiary to report it at once to the State Inspector at Boston. Beekeepers are required to avoid spreading of disease by not permitting robbing in the apiary under any conditions, and in case the treatment given is not in accordance with the instructions of the inspector he is authorized to destroy bees and equipment. All bees in boxes or hives not permitting inspection shall be transferred within the time authorized by the inspector. No bees shall be brought into the state except in accordance with the special provisions of the law.

Dr. Burton N. Gates, of the State Department of Agriculture, is the inspector.

A Wide-Awake Organization

The Vigo County, Indiana, Beekeepers' Association is one of the most active county organizations to be found anywhere. Their annual short course was held at Terre Haute on February 28 and 29 with a strong corps of speakers. Large space was given to the program by the daily papers of the city. One or two such active organizations of beekeepers in every state would shortly work a great change in the status of the beekeeping industry.

A New Bulletin

A bulletin entitled "Beekeeping in Ohio" has recently been issued by the State University at Columbus. It is adapted from the bulletin "Beekeeping in Oregon," by H. A. Scullen and modified to suit Ohio conditions by Florence Naile, Secretary of the Ohio Beekeepers' Association. This is the kind of bulletin that should be in the hands of every beginner with bees, and we recommend that Ohio beekeepers write for a copy, which will be sent free on application to the State University at Columbus, Ohio.

Foulbrood Treatment for Montana

The University of Montana is publishing a bulletin on "Bee Diseases in Montana," with description of foulbrood, both American and European, and methods of treatment. The bulletin is by Mr. O. A. Sippel, Instructor in Beekeeping. When asking for it, from the University, call for Circular 120. The only way to do away with diseases is to be posted concerning them and the methods of treatment.

New York Moves Forward

At the last session of the legislature the state of New York provided liberally for the support of beekeeping. In addition to making liberal provision for extension work and inspection, funds were set aside for establishing a chair of apiculture at Cornell University.

Sugar Still High

We notice recent quotations from wholesale grocers giving granulated cane, or beet sugar at a price of $9.50 per 100 pounds.

From this it would appear that sugar prices are to rule high, at least until early fall. By this time we will know something of the size of the honey crop and will also have had sufficient opportunity to dispose of some of the new crop as well as what is left of the old.

Boggs Resigns

Newton Boggs, Colorado Bee Inspector, has resigned his position and will take up graduate work at Iowa State College this coming fall. R. G. Richmond will succeed Mr. Boggs as inspector.

Iowa Man to Kansas

Mr. G. M. Kreger, of Winterset, Iowa, one of Prof. Paddock's men from Ames, has associated himself with the G. B. Lewis Company of Wichita, Kansas, and will succeed Mr. Sam Friedman as manager there.

Delaware County (N. Y.) Picnic

A beekeepers' picnic will be given at the home of Meade Elderkin, Walton, Delaware County, New York, on Wednesday, August 6. Professor R. B. Willson, of Cornell, will be present for the program.

Michigan Meetings

Arrangements have been made for three major district beekeepers' summer meetings and field meets in Michigan, as follows:

July 23, apiary of Frank Abbott, Palm, Sanilac County, for the beekeepers of the Thumb district. Last year this meeting was held at Mr. David Running's apiary and was attended by over 150 beekeepers.

July 25, apiary of Earl Kellar, Medina, Lenawee County, for the beekeepers of southern Michigan. The meeting held at Mr. Kellar's apiary in 1921 was attended by over a hundred beekeepers.

August 6 and 7, the sixth annual summer meeting of the Michigan Beekeepers' Association will be held at Traverse City. Since Traverse City is in the heart of the vacation grounds of Michigan, with fine fishing and wonderful beekeeping locations as well, many beekeepers will attend this meeting from a distance.

Outside speakers are being secured for all of these meetings and beekeepers from adjoining states are cordially invited to attend.

Ohio Field Meet

The Annual Field Meet of the Ohio Beekeepers' Association will be held on Friday, August 1, at the Benninghof Apiaries on the Hartman farm, 3 miles south of Columbus. Interurban cars from South Columbus stop at the apiary, and there will be ample shelter in case of rain. Dinner may be obtained on the grounds.

George S. Demuth, editor of Gleanings in Bee Culture and well-known authority on practical and scientific beekeeping, will talk on "Comb Honey Production"; Professor J. S. Hine, of Ohio State University, will discuss "The Honey Plants of Ohio;" L. H. Benninghof will explain the importance of making the State Fair Exhibit a success, and F. B. Moore. President of the Association, will talk on "Better Methods of Selling Honey." All persons interested in "Better Beekeeping" are invited to attend.

Michigan State Summer Meeting

The Michigan Summer Meeting will take place at Traverse City, August 6-7, and our editor has promised to be there. Traverse City is on Grand Traverse Bay in the northwest part of the lower peninsula and a great place for tourists. Many will probably come there in automobiles and a good time is expected.

The Western Honeybee

The editorship of the Western Honeybee changes hands again with the retirement of Mr. Knabenshue and the appointment of C. A. Wurth as editor.

Our good wishes go with the retiring editor, who has served the Honeybee so faithfully. We expect that his successor will be fully able to continue the good work since he is well qualified in experience and judgment for the place. Mr. Wurth is an Indiana man. His grandfather was one of the large beekeepers of his day and young Wurth gained early knowledge which has been added to by large experience with some of our best honey producers and as an independent beekeeper. Good luck to you, Wurth.

A Circular by Merrill

The "Inspection and Care of Bees" is the title of a circular by Dr. J. H. Merrill, State Apiarist, Manhattan, Kansas. It gives a description of the adult and brood diseases, and good suggestions for treatment.

Crop and Market Report

Compiled by M. G. Dadant

For our July number we asked reporters to answer the following questions: What is the condition of bees at present as to strength and food? How is the crop? What are the prospects? Any 1923 honey left?

CONDITION OF BEES

In practically all instances throughout the country bees are coming into good condition but have been, at least until the honey crop started, extremely short of stores. In some instances this has meant that where the beekeeper either could not afford to give feed or did not take proper precaution, the bees have dwindled and in many cases were not in prime condition for the honey flow. Some of the states where this is especially noticeable are Indiana, Wisconsin, Minnesota and northern Iowa, as well as Idaho.

This is also true very largely in California, where the spring has been extremely unfavorable and in many instances outside the orange bloom area bees have suffered a great deal. In fact, I have a letter from one of the large honey producers in that section stating that it was cheaper to let the bees starve and begin anew than to feed them expensive sugar, which would have to be done in order to carry the bees through.

THE CROP

Of course it was too early when reports were sent in to us about June 4 for many localities to have any idea as to what the crop was going to be.

However, Virginia was having an extremely good crop, as well as the entire South. Reports from Georgia and Florida are to the effect that they have had a bounteous crop there and prospects are good for the future.

In Texas the crop has been very good, indeed, although in many parts cut down by cool and rainy weather. This has probably hindered considerably, especially on the mesquite flow, from which so much was expected. However, Texas is experiencing a much better flow than last year, although the earlier crops of honey are being harvested at a very remunerative figure.

In practically all sections of the East, Central West and Plains area the bees have not been able to get a living up until the clover flow, from the fact that the weather was too cool and unfavorable. This made the honey flow from fruit bloom negligible, although in some sections bees have gathered considerable honey from dandelion. This applies especially to Minnesota and the Dakotas and surrounding territory. A report from the Dakotas states that there is now (June 15) a good flow on there, with prospects that it will continue throughout the rest of the summer.

PROSPECTS AHEAD

In practically all areas of the East and Central West reporters are looking for a very good crop from the clover from now on, although, of course, honey plants in most instances are from two to three weeks late.

There are only a very few states that are not looking for an average crop. Even in these states the conditions are spotted and some reporters are expecting a very fair average. The states referred to are Wisconsin, Michigan, which had a large crop last year, Minnesota and South Dakota, also some parts of Iowa. Western Iowa seems to have been especially hard hit this year, the bees not coming into condition in good shape. Following this the weather was cool and very dry, which retarded the honey plants as well as the bees.

However, copious rains in this section have somewhat altered the conditions and a fair crop is now expected.

In fact the many areas which previous to June 10 were reporting conditions too dry and possibility of the curtailment of the honey flow for that reason, have now had general and copious rains, so that the prospects have altered considerably and there are hopes now for a very fair crop.

In fact, in many parts of the Central West, rain has been sufficiently abundant so that it is retarding the proper care of corn and many corn fields are growing up in weeds at the present date.

If the rains continue any length of time it will probably mean in the fall honey sections a very good chance for the clover flow to merge into the Spanish needle and heartsease flow a little later on.

California seems discouraging. Reports from there state that although the orange honey flow was considerably in excess of last year the sage crop will be nil although there will be small crops gathered from wild buckwheat and other western flora, still the bulk of the crop will not be much if any in excess of last year.

Other reports from adjacent areas would indicate that there will be considerably more honey than last year in these parts of California. It is doubtful, however, whether the crop will be sufficiently large to make any big showing in the total of carload shipments for 1924.

HONEY ON HAND

We know of but three carloads still in the hands of producers, and these expect to move them before the new crop is well on the market. Two of these cars are in Colorado and the other in Washington. The Washington car is being held for a price of 11c f. o. b. shipping point, which you will see is a very fair figure, indeed.

Reports coming in from the brokers on the California coast would tend to indicate that there are still a few cars of sweet clover honey available, but that the producers are holding these at a price in the neighborhood of 9c per pound f. o. b. shipping point.

In practically all instances in the Central West, as well as in the East and South, including Texas, the entire 1923 crop has been sold and the markets are ready for the new crop of honey.

In Texas, especially, the new crop has already been moving with rapidity.

Of course it is too early yet to tell what the magnitude of the new crop will be, but most certainly the market will not be overstocked with old honey when the new crop comes on, although the demand, on the other hand, does not seem to be especially brisk.

However, we have one or two reports to the effect that honey is now selling much better than it has for several years at this time of year.

SUMMARY

All in all, it would appear that there is going to be a shortage of honey in California similar to 1923. The Inter-mountain territory looks good, and if the weather turns right so that it will tend toward best nectar secretion it looks like all clover areas would have a very fair crop this year and in many localities the crop should be excellent.

There has been considerable swarming in the white clover areas, but not sufficient to cut in very greatly on the total crop should climatic conditions be favorable toward a flow.

Already reports are coming in from the southern part of this section that clover is yielding very well and bees are beginning to store a surplus.

Usually the crop should have been started by June 10, but we are in 1924 about two weeks late, so that it would not be surprising if the bulk of the crop would not be coming in until the last two weeks in June and lasting well into July.

Our idea would be that the total crop for the country, based on present prospects and reports, would likely be much in excess of 1923, which was a short year.

CLASSIFIED DEPARTMENT

Advertisements in this department will be inserted for 5 cents per word, with no discounts. No classified advertisements accepted for less than 35 cents. Count each initial or number as one word.

Copy for this department must reach us not later than the 15th of each month preceding date of issue. If intended for classified department it should be so stated when advertisement is sent.

As a measure of protection to our readers, we require references of all new advertisers. To save time, please send the name of your bank and other references with your copy.

BEES AND QUEENS

HONEY IN PAILS—
Atwater, Meridian, Idaho.

PURE ITALIAN QUEENS—Untested, $1.00; tested, $1.25; 2-lb. package, $2.75. Add price of queen wanted. Safe arrival guaranteed after May 10. Write for prices on colonies.
Birdie W. Hartle,
924 Pleasant St., Reynoldsville, Pa.

BRIGHT ITALIAN QUEENS—1, $1.00; 12, $10.00; 100, $75.00. Write for prices on package bees.
T. J. Talley,
Rt. 3, Greenville, Ala.

GOLDEN ITALIAN QUEENS, untested, $1.00; 6 for $5.40; 12 or more, 80c each. Tested, $1.50. Select tested, $2.50. No disease good queens. Safe arrival and satisfaction guaranteed.
D. T. Gaster,
Rt. 2, Randleman, N. Car.

PACKAGE BEES—Circular free.
Van's Honey Farms, Hebron, Indiana.

$70.00 per hundred we are asking for our June queens. Let our circular tell you more of them.
R. V. Stearns, Brady, Texas.

MAYEUX'S non-swarming queens. Three-banded; 2-frame nuclei with an untested queen, $2.75 each; 10 to 20; $2.65 each; 25 to 100, $2.50 each. White clover seed, 1 to 10 pounds, 70c per pound; 25 to 100 pounds, 60c per pound. For larger quantities write or wire for prices.
L. C. Mayeux Hamburg, La.

GET THE BEST—Package bees, 1924 delivery, ready April 20. Bright three-banded Italian bees and queens. Two-pound packages with untested queens, $4.50 single package; twenty-five or more, $4.25. Tested queens, single $1.50 each; twenty-five or more, $1.25. Untested queens, $1.00 each, or $80.00 per hundred. Also a limited amount of Hybrid bees. Two-pound packages with bright three-banded Italian queens at $3.50; twenty-five or more, $3.25. Three hundred two-frame nucleus at $3.50 each, with untested queens same as above. Terms, 10 per cent with order, balance date of shipment. Safe arrival guaranteed, no disease.
H. M. Rains, Gause, Texas.

"SHE-SUITS-ME" three-banded Italian queens, untested, $1.00 each, after June 1; in May, $2.00 each. If you wish 50 or more, write for price list. Tested queens, $3.00. Nuclei and packages of highest quality at reasonable prices.
Allen Latham, Norwichtown, Conn.

GOLDEN Italian Queens. Tested queens, $2 each; untested queens $1 each; when I have them hybrids 3 for $1. Satisfaction in all cases.
J. F. Michael,
Rt. 1, Winchester Ind.

CAUCASIAN QUEENS—Untested, $1.50, tested, $2.50. Bees, 3 pounds without queen, $4.50. Shipment provided for with candy made from invert sugar. Bees not shipped on combs. Safe delivery guaranteed.
H. Rauchfuss, Englewood, Colo.

QUEENS—Queens by return mail, 3-banded, large, bright, hustlers. Selected untested, 1, 80c; 12, $8.00; 100, $60.00. Selected tested, 1, $1.25; 12, $12.00. No disease; ship only the best; good service and satisfaction guaranteed.
W. C. Smith & Co., Calhoun, Ala.

CARNIOLAN QUEENS—Bred from imported mothers of pure Alpine stock. Lockhart's best select breeding strain is their support. No better combination could be arranged. Prices, 1 select untested, $1.00; 6, 90c each; 12, 80c each, and 25 or more, 75c each. Circular free. M. G. Ward, Lathrop, Calif.

HIGH GRADE QUEENS—at utility prices. Write for circular.
R. V. Stearns, Brady, Texas.

TRY PETERMAN'S QUEENS—I select out and sell only perfect, large, thrifty layers, killing all others. I figure this pays for repeat orders. They are bred from choice Jay Smith breeders by a thoroughly experienced breeder who is absolutely honest and reliable. Circular free. Reduced prices after June 30: 1, $1.00; 6, $5.50; 25, 90c each; 100, 80c each
H. Peterman, Lathrop, Calif.

MY 5-BANDED GOLDEN QUEENS will be ready April 1. One queen, $1.00; six queens, $5.50; twelve queens, $10.00.
W. W. Talley, Greenville, Ala., Rt. 4.

IF YOU WANT good, bright Italian queens by return mail, send your order to us; 75c each, $8.50 per dozen. One-pound package with queen, $2.75; 2 lbs., with queen, $4.50. We pay charges.
Graydon Bros., Rt 4, Greenville, Ala

WARRANTED PURE MATED Italian queens, $1.25 each. Mailed in special introducing cages that never fail; sent by return mail next day. No honey used in candy.
Daniel Danielsen, Brush, Colo.

BIG, bright Italian queens, 75c each, by return mail. P. B. Skinner, Greenville, Ala.

ITALIAN QUEENS—The quality kind; 3-bands or goldens. One, 80c; six, $4.50; dozen, $8.00. Virgins, 30c; tested, $1.50. Fall requeening will reduce winter loss and insure a crop for next season. Satisfied customers everywhere Complete satisfaction guaranteed. Crenshaw County Apiary,
Rutledge, Ala.

NORTH CAROLINA BRED Italian queens of my Root and Miller strain of 3-banded Italian bees. They are gentle and good honey gatherers. From July 1 until October 1, untested, $1.10 each or 11.00 per dozen. Tested, $1.50 each. Selected tested, $2.50 each. No disease. State inspected; safe arrival and satisfaction guaranteed.
L. Parker, Rt. 2 Benson, N. C.

QUEENS cost $1.00 to $2.00. Rexford's Push-in-Comb Introducing Cage improved so as to release queen automatically, cost, 35c; three, $1.00. It pays. Try it.
O. S. Rexford, Winsted, Conn.

BEES BY THE POUND; also Queens—Booking orders now. Free circular gives prices, etc. See larger ad elsewhere. Ault Bee Co. (Successors to Nueces County Apiaries), San Antonio, Tex. E. B. Ault, Prop.

SEE my display ad., page 351
Jes Dalton, Bordelonville, La.

FOR SALE—Italian bees and queens. One-pound package with untested queen, $2.50; 2-lb. package with untested queen, $3.50. Queens, untested, up to May 15, $1.00 each.
O. P. Hendrix & Son, West Point, Miss.

GOLDEN ITALIAN QUEENS, producing bees solid yellow to tip. Selected untested, $1.00; tested, $2.00. Disease free; safe arrival and satisfaction guaranteed.
H. G. Karns, Victoria, Va.

FOR SALE—Golden Italian queens. Untested, $1.00; 6 for $5.50; 12 or more, 80c each; tested, $1.50; select tested, $2.50 each. Write for prices on large quantity. No disease of any kind. Safe arrival and satisfaction guaranteed.
Sam Hinshaw, Randleman, N. C.

GOLDEN THREE-BANDED and Carniolan queens. Tested, $1.00; untested, 75c each. Bees in 1-pound package, $1.50; 2 pounds, $2.50; 3 pounds, $3.25. Safe delivery guaranteed. C. B. Bankston,
Box 65, Buffalo, Leon Co., Texas.

BRIGHT Three-band Italian Queens—$1.00 each, 6 or more 75 cents. Two and three-frame nuclei. Tupelo Apiaries,
J. L. Morgan, Apalachicola, Fla.

I AM all booked for this month for Caucasian queens. Try my Italians at 50 cents by return mail.
Peter Schaffhauser, Havelock, N. C.

BREEDER of fine Italian queens.
C. B. Saunders' Apiaries, Merom, Ind.

ITALIAN QUEENS of quality, $1.00 each, $11.00 for 12.
W. E. Buckner, Mt. Vernon, Ga.

FOR SALE—Three-banded Italian queens and bees ready for June 5 delivery. Price: 1 untested queen, 85 cents each. One 2-pound package with queen, $3.00 each. Health certificate with each shipment. Address to John St. Romain, Marksville, La.

MERRILL'S QUEENS—$1.00 each.
R. E. Merrill, Muncy, Pa.

BRIGHT three-banded Italian queens. Prices before July 1, one $1.25; six, $6.50; twelve, $12.00. Prices after July 1, one, $1.00; six, $5.00; twelve $9.00. I guarantee safe arrival, pure mating and satisfaction.
J. F. Diemer, Liberty, Missouri.

FOR SALE—Three-band Italian bees and queens. Two-pound package bees with select untested queens, $4.25; one select untested queen, $1.00; one selected tested queen, $1.50. J. Allen, Catherine, Ala.

PACKAGE BEES & QUEENS—Italians or Carniolans. I can save you express charges. See larger advertisement for prices.
J. E. Wing, San Jose, Calif.

HARDY ITALIAN QUEENS—$1.00 each.
W. G. Lauver, Middletown, Pa.

GOLDEN and three-band queens reared in separate yards; booking orders for 1924. Untested, one, $1.25; doz., $11.50. Safe arrival guaranteed in U. S. and Canada.
Tillery Bros., R. 5, Greenville, Ala.

FOR SALE—Will sell from one to 75 colonies Italian bees, 10-frame hives, metal covers and one super each. Stock from the best breeders in the country, on wired frames and full sheets foundation. Guaranteed free from disease. Will ship any time buyer wishes in spring. Reason for selling, have more than I can keep in one yard. Price $10.00 f. o. b.
Bert Gander, Bayard, Iowa.

FINEST ITALIAN QUEENS, $1.00 each.
Wm. R. Stephens, Wingate, Ind.

BIG, bright, northern bred Italian queens. Bred for beauty and honey-gathering qualities. Untested, $1.00 each; $11.00 per dozen.
M. P. LeMunyon,
R. F. D. No. 3, Cassopolis, Mich.

3-FRAME NUCLEUS—Italian bees with queen introduced, $6.50. Prices on queens upon request.
Fairmount Apiary, Livingston, N. Y.

BARGAIN SALE—40 colonies of Italian bees with equipment. Write me at What Cheer, Iowa. Henry Reynolds.

GOLDEN ITALIAN QUEENS, the big, bright, hustling kind; satisfied customers all over the United States. Untested, $1.00 each; 6, $5.00; 12, $10.00; 100, $70.00. Tested, $1.50.
E. F. Day, Honoraville, Ala.

FOR SALE

FOR SALE — White and amber extracted honey. Write for prices. State quantity wanted. Dadant & Sons, Hamilton, Illinois.

HONEY IN PAILS—
Atwater, Meridian, Idaho.

FOR SALE—Good second-hand 60-lb cans, 2 cans to a case, boxed, at 60c per case, f. o. b. Cincinnati. Terms cash.
C. H. W. Weber & Co., 2163 Central Ave.,
Cincinnati, Ohio.

FOR SALE—Second-hand 5-gallon cans. Only good cans offered. Two cans each case. Per 10 cases, $6.50; per 25 cases, $15.00. Ask for prices on quantity lot.
A. I. Root Co., 230 W. Huron St., Chicago, Ill.

FOR SALE—Standard Extracting combs wired frames, 20c. No disease. Hive bodies, empty, 75c; with 10 Hoffman frames, nailed and painted, $1.50.
Fred Olson, 1923 Grand, St. Paul, Minn.

FOR SALE—Golden Italian queens. Certificate of State Inspector with each shipment and safe arrival insured. If you haven't seen my prices in May issue of this Journal drop me a card for price list.
Hazel Bonkemeyer,
Rt. 2, Randleman, N. C.

FOR SALE—About 50 colonies bees, healthy, with complete super and extracting outfit, at a bargain.
C. H. Mundorff, Kirkwood, Ill.

FOR SALE—One Cowan 4-frame reversible honey extractor. Nearly good as new. Will sell at half price.
Geo. L. Anderson, Star Route, Clayton, Ill.

FOR SALE—2 acres, with 5-room house, etc., bearing orchard of 30 trees, about 20 colonies bees and equipment, in Washington County, Wisconsin (termed by Dr. Fracker best honey-producing locality in the world), on highway 15 (600 miles of cement, St. Louis to Green Bay), $3,500; $2,500.00 cash, $1,000.00 mortgage. Chance of a lifetime to secure location where you can produce bumper crops of the finest honey and sell every pound to tourists at your own door. M. R. S., care A. B. J.,

FOR SALE—31 colonies of bees; ten-frame hives. Guaranteed free from disease $6.50 each. L. P. Mills, Johnstown N. Y.

FOR SALE—Choice bright Italian queens. I have been building up this strain for the last 20 years for vigorous hustlers, good winterers gentleness and fine color. These queens will equal the best on the market. Health certificate goes with queens. Prices: untested queen $1.25; 12, untested queens, $12.00; 1 breeder, $5.00.
Emil W. Gutekunst, Colden, N. Y.

HONEY AND BEESWAX

FOR SALE—White honey in 60-lb. cans; also Porto Rican in 50-gal. barrels. Samples and prices on request.
A. I. Root Co.,
16-18 Jay St, New York, N. Y.

HONEY IN PAILS—
Atwater, Meridian, Idaho.

FOR SALE—Comb and extracted white clover honey. Extracted in 60-lb. cans, 5 and 10-lb. pails. Prices given on request. Sample 15c. F. W. Summerfield,
Waterville, Ohio.

BEESWAX WANTED—We need large quantities of beeswax and are paying good prices now. Ship to us at Hamilton, Ill., or Keokuk, Iowa, or drop us a card and we will quote f. o. b. here or your own station, as you may desire. Dadant & Sons, Hamilton, Ill.

ROBINSON'S comb foundation will please the bees, and the price will please the beekeeper. Wax worked at lowest rates.
E. S. Robinson, Mayville, N. Y.,
Chau. County.

FOR SALE—120 acres irrigated unimproved land in Wyoming, $30 per acre. Will grow 500 tons alfalfa per year. Easy terms. Would accept some bees in 10-frames or larger equipment on this.
Asher F. Dillard, Walthill, Neb.

FOR SALE—Our own crop white clover and amber fall honey in barrels and cans; also white alfalfa in cans. State quantity wanted and we will quote prices. Samples on request.
Dadant & Sons, Hamilton, Ill.

HONEY FOR SALE in 60-lb. tins. White clover honey crystallized, 13c per pound. L. A. West Indian honey, liquid, 11c per pound. Hoffman & Hauck, Inc.,
Woodhaven, N. Y.

FOR SALE—45 cases of 60-lb. cans, two to a case, 30c each; used once for clover honey. Need the room, why I offer them so cheap. Odell F. Burch,
Chincoteague, Va,

HONEY—New crop extracted, finest thick, Florida white tupelo. Several tons in new barrels. Thoroughly ripened on hives; guaranteed not to granulate or ferment. Sample 15c
M L. Nisbet & Bro., Bainbridge, Ga.

SUPPLIES

SOUTHWESTERN distributors for Robinson's comb foundation. Send for price list. Holloway Bros., Marietta, Okla.

HAVE YOU any Bee Journals or bee books published previous to 1900 you wish to dispose of? If so send us a list.
American Bee Journal, Hamilton, Ill.

SPECIAL PRICES—We are offering at specially low prices some very high grade material in shipping cases, frames, hives and miscellaneous which represent items we no longer carry regularly in stock or which have to be closed out to make room for new stock specially equipped to take Dadant's Wired Foundation. If interested, write for list; we can save you money.
Dadant & Sons, Hamilton, Ill.

CONNECTICUT and Rhode Island headquarters for Root's Beekeepers' supplies.
A. W. Yates, 3 Chapman St., Hartford, Conn.

WESTERN BEEKEEPERS—We can demonstrate that you can save money on buying bee supplies of best quality. Write for our latest price list.
The Colorado Honey Producers' Association,
Denver, Colo.

ATTRACTIVE LOW PRICES—Write us for list of odds and ends, shipping cases, hives, etc., first grade, priced to save you money.
Dadant & Sons, Hamilton, Ill.

GALVANIZED Bee Hive Covers—We can furnish promptly, made to your specifications from galvanized sheets of our own manufacture. Send us your inquiry.
The New Delphos Mfg. Co., Delphos, Ohio.

NEW four-frame reversible extractor, 9¾ pockets, $40.
Lorenzo Clark, Winona, Minn.

MISCELLANEOUS

HONEY IN PAILS—
Atwater, Meridian, Idaho.

BEES AND HONEY—George W. York, editor, Spokane, Wash. Sample free.

GLEANINGS IN BEE CULTURE, published at Medina Ohio, is the most carefully edited bee journal in the world. Its editor-in-chief is Geo. S. Demuth. Its field editor is E. R. Root. Ask for sample copy.

WE HAVE NOW ON HAND, from Paris, a number of copies of the excellent work of Perret-Maisonneuve, in French, entitled "L'Apiculture Intensive & L'Elevage des Reines." The first shipment was delayed over two months. The price of this very progressive work is $1.50 by mail, prepaid.

THE BEE WORLD—The leading bee journal in Britain, and the only international bee review in existence. It is read, re-read and treasured. Will it not appeal to you? Specimen copy free from the publishers. The Apis Club, Benson, Oxon, England. Send us a postcard today. It is well worth your little trouble.

THE DADANT SYSTEM IN ITALIAN—The "Dadant System of Beekeeping" is now published in Italian, "Il Sistema d'Apicoltura Dadant." Send orders to the American Bee Journal. Price $1.00.

THE "Archiv fur Bienenkunde" is a valuable scientific publication. "It merits the appreciation of all beekeepers acquainted with the German language," says the Bee World (January, 1923). "The Archiv fur Bienenkunde, now in its fifth volume, is of as high grade as any bee journal which comes from abroad, dealing especially with the scientific aspects of beekeeping," says Gleanings in Bee Culture (February, 1923). Annual subscription, $1. Specimen copy free. Publisher, Theodor Fisher, Freiburg im Breisgau, Kirchstrasse 31, Germany.

WILL EXCHANGE Singer sewing machine, also used honey cans, for honey. Amber honey wanted for cash.
Harris Mercantile Co., Jackson, Tenn

WANTED

HONEY—State price and send sample.
Paul Thomae, 1157 Third St.,
Milwaukee, Wis.

WANTED—Shipments of old comb and cappings for rendering. We pay the highest cash and trade prices, charging but 5c a pound for wax rendering.
Fred W. Muth Co.,
204 Walnut St., Cincinnati, Ohio.

WANTED—Car or less lots of clover honey; mail sample and quote lowest cash price.
A. W. Smith, Birmingham, Mich.

COMB HONEY WANTED—
J. Gakler, Rt. 1, Memphis, Tenn.

WANTED—Iowa honey producers to send me their names for future use; I deal in honey. Nelson Lamb, Bloomfield, Iowa.

HONEY—Quote price car loads and less. Send sample.
Hofmann Bros., Produce Co., St. Louis, Mo.

WANT bees and equipment for western Minnesota forty or Red River Valley quarter. A. M. Wise, Appleton, Minn.

WANTED—Work in Apiary, anywhere. Experience with bees and handy with carpenter's tools.
E. G. Roberts, Shelbyville, Tenn.

The Large Hive in Iowa

In talking with beekeepers in northwestern Iowa one gets the impression that the large hive is standard equipment and that the ten-frame hive is fast becoming an odd size. Most of the beekeepers in this territory are sold on the merits of the large hive for beekeeping profits.

Domestic Science and Honey

At a recent convention, it was suggested by a prominent beekeeper that domestic science teachers would be much interested in the use of honey in cooking if beekeepers properly approached them and offered to furnish honey for their use in the schools and literature for distribution among their students. Probably much effective work could be done in this way.

Over Production

"Too much honey is produced some years, so that the producer finds difficulty in marketing his product." What a foolish statement! It is entirely without foundation. If one of the larger Chicago grocers was aided to proper distribution of honey, there would not be enough honey in his territory to supply his demand. If the producers of honey were to get properly back of any national advertising and marketing efforts there would not be enough honey in the United States to any more than grease the wheels of the machinery, and the advertising effect would be wholly lost for a lack of honey to supply the demand. There is no such thing in sight as an over-production of honey. There is poor distribution and poor marketing, but not over-production. G. H. C.

Ants in Florida

In reading Mr. Sechrist's article on tropical beekeeping (September number), I note he says the tendency is towards small colonies.

That we find to be so, but we also find a cause for it, which is ants of two kinds. One kind, so small you can scarcely see them, attack the bees and sting them to death. The other, a large one, carries off many of the bees bodily. Where protected from these pests, my observation in the last year is that our colonies are larger than in the north, where I have kept bees.

George Gordon, Miami, Fla.

Honey in Candy Popular

The J. M. Collins Co., of Minneapolis, which manufactures Honey Scotch, writes that it is building a branch factory at Philadelphia. The company does not confine its output to Honey Scotch, the production being equally divided between it and Walnettos. The Minneapolis plant has a capacity of 17 tons per day and the new branch will add twenty more.

Candy End Up

C. B. Palmer, of Bradshaw, Neb., calls attention to the fact that when introducing queens by the cage method that the cage should be placed in the hive in such manner that the passage way will not become clogged with dead bees and thus prevent the escape of the queen when the bees have removed the candy. If the cage is placed in the hive with candy end down this is very likely to occur.

The International Congress at Quebec

We wish this Congress to meet good success; to that end we need the co-operation of one and all. The good reputation of the American beekeepers is up to us to maintain. We therefore are asking all the American beekeepers who want to take their part of this Congress to send us as soon as possible the amount of their adhesion fee, which is two dollars ($2.00). Every active member will receive the complete report of said Congress, the latter to be published in French and English. Write us to reserve hotel rooms.

C. Vaillancourt,
Ministry of Apiculture, Quebec.

Brenner Honored

Guadalupe County, Texas, beekeepers presented a gold medal to Henry Brenner at the recent annual picnic. The Brenner apiary has been formally taken over by the State of Texas to be conducted as an experiment station in the future.

A PASTE RECIPE

By Mathilde Candler.

This paste will not sour and will stick every time. If too thick, thin with a little water. To paste on tin, add a little muriatic acid, about a teaspoonful:

Wheat flour, 8 ounces; powdered alum, ¼ ounce; water, 1½ pints; glycerine, 1½ ounces; oil wintergreen, ⅛ ounce (or 1 teaspoonful). Mix thoroughly.

Mix water, flour and alum to a smooth paste; boil till it thickens. Be careful not to burn or boil too long. Take from fire, add oil and glycerine and mix thoroughly.

Wisconsin.

Hawaiian Honey

Hawaii sent 90,815 pounds of honey to the United States in 1922, as compared to 56,891 in 1921 and 37,129 in 1913, according to figures published by the Honolulu Star Bulletin.

Carlot Shipments of Bees

Mr. Frank Rauchfuss, of the Colorado Honey Producers, is endeavoring to secure a modification of the railroad regulations so as to permit an attendant for carlot shipments of live bees as is already provided in cases where shipments of cattle, sheep or other livestock are carried.

BURR COMBS

IDLE THOUGHTS

By M. G. Dadant.

What do you think of that? Here we all have been arduously wielding a laborious pencil to make a thing of beauty of this last page. Here we've been trying to strengthen the weak spots of each number by a patch of wax here and there, a little piece of comb right along the topbar. Here we've been secretly trying to head off that unending quibble between Jes Dalton and Pellett as to who the ancestors of that strong pointed hive on the end of the last row were. You know one of them claims that the ancestors had their domain in the belfry of old Castle Bienebum in Kickan-Slowbackhier. The other one just as vociferously says they whizzed past the ears of poor old innocent Ponce de Leon when he first found out that the Everglades were a bunch of dismal swamps and not a tank of Pluto water for the prolonging of effervescent youth.

Here, I say, we have been doing all these meritorious things in this Burr Combs page, submerging ourselves that the Journal may be a well rounded out whole. And now comes Pellet and tells us we're all wrong. That this isn't supposed to be a lecture page at all. That what he wants and you want in this page is personal news stuff, something that will make you forget the sugar you've fed and the foulbrood you've had. Odds and ends of notes that don't appear anywhere else.

He says he'll try to get together the sound meat of the Journal if we'll furnish the sausage. He'll be the fruit, so to speak, if we'll be the nuts. And Cale, interested like, backs him up—says he thinks so too. He'll help along with the fruit.

So be it, then, Mr. Pill (pellett) and Mr. Kohl-rabi (cale). I'd rather be a nut than a prune any day, any way, anywhere; so there. The nuts don't spoil so easily, even if they are a trifle hard to crack.

Well, we've finally had our rains, anyway, and I notice the women folks are hunting up their fans to keep themselves warm. so I guess summer is here at last. Glad of it. There's been a lot of blue fog arising from around Cale's "blessed bees" all spring. Cold and dry, then dry and cold. Robbing and feeding, then feeding and robbing for a change.

Looked like that old reprobate, the worm, never would turn and give us just what we thought we were entitled to. At this date, June 16, the bees are just about through robbing and we're hoping will abandon the full sugar pail for the full dinner pail. It certainly has the earmarks of weather which should be nectar-producing, and a "fair chance" of clover, too.

Our senior boss, C. P., I think has about the right slant on that "sob stuff" called discouragement. When I was much younger and less bald (that was before I married my first wife, whom I still live with) I used to think it was because he wanted to curb us, or urge us, as the wind changed.

He always says: "When things are booming, everything lovely, look out; trim your sails, there is bound to be a reaction; but when all is discouragement, everything blue, then drive ahead for the better time coming." It looked like he was always telling us to do what we didn't want to; giving us a boost when we might sulk, putting on the muffler when we wanted to speed.

I don't know whether he became a beekeeper because he was that way, or whether he is that way because he is a beekeeper, or whether it's just—experience. But anyway, his advice certainly works out in a bigger majority of instances than the drone-trap method of swarm control or the plan of selling quantities of honey by cutting prices on the grocer whom you have just loaded up.

I've noticed that there are mighty few beekeepers who are right down at heart, pessimists. I'll warrant a majority of our readers are already looking towards 1925. Looking for summer rains and a good wet fall. I know that I am.

And what if it hasn't been a good spring for bees. It's been great for radishes, and weeds haven't been hard to keep down. Fruits and nuts are growing—seem to be. But, pshaw! Now we've had our rains and bees are working, the weeds have started to grow. So there you are. Every silver lining has a black cloud—if you're a pessimist. We wish half our life away hoping for the future, and spend the other half wishing we could live the first half over.

Here I've wandered along for half my page, said what I wanted to and not what Pellett told me to. I've spoiled my reputation with a likely possibility of his also ruining my complexion.

Personal news, odds and ends, eh! How we live and move. Wants me to tell about my four children, how nice they are; and I immediately think of the Chateau-Thierry I just averted on the west porch. Wants me to tell about my nice home, and there pops into my forgetful head that stopped-up cellar drain, and the roof that persists in leaking just over the dining-room window.

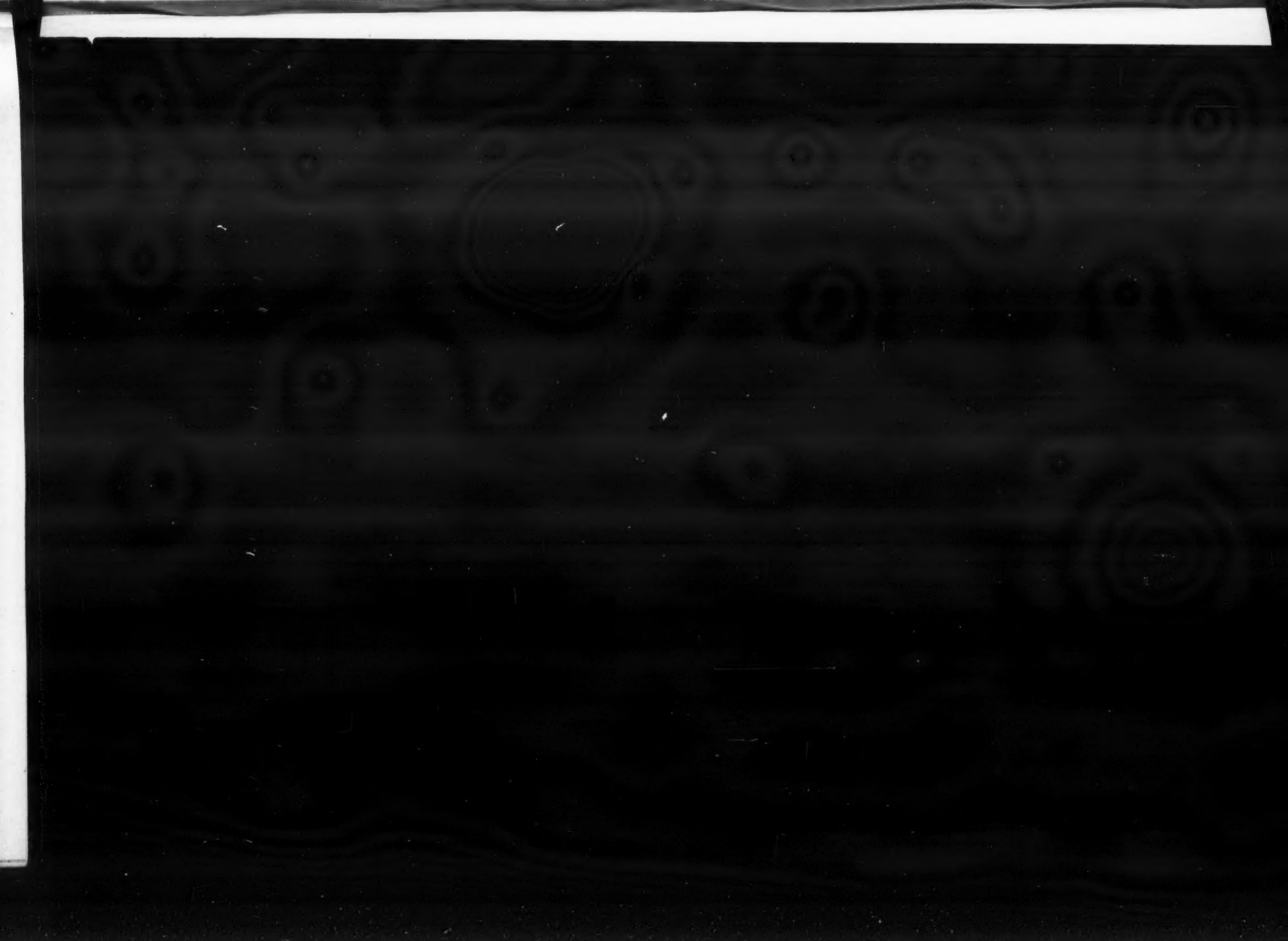
He wants me to tell about my garden, my weedy garden, with its worm-stripped currant bushes and my grape vines with their abhorrently scanty crop for these wet yet dry days when grapes find so many uses.

Next he'll be wanting to know how old my wife is, if she looks as good in the early morning light as she appears to look when candles throw their radiance in the dusk of evening. Readers, I arise to a point of personal privilege. I object. And, besides, each of you married beekeepers can come as close to guessing the age of your own wife as I can to mine. And you'll guess it weakly and under your breath, too, especially if there's any company around.

And, besides, if I went and did all these things, then where would I be? Would I have pleased Pellett, even if I had pleased the rest of you? Would he be satisfied? Would I get approbation or———nation?

I feel just like a public speaker I know who always manages to get by with his audience. I feel like saying a whole lot and telling him nothing. That way there won't be any disagreement anywhere.

After all, variety is the spice of life, even though some prefer basswood to honeydew and tupelo to bitterweed. If it were not for the burr combs there'd be a lot of these would-be beekeepers who'd never know when to put on supers.



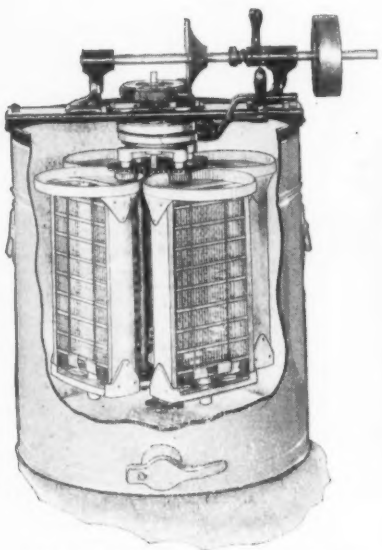
Save the Lost Honey

By Buying a Good Extractor

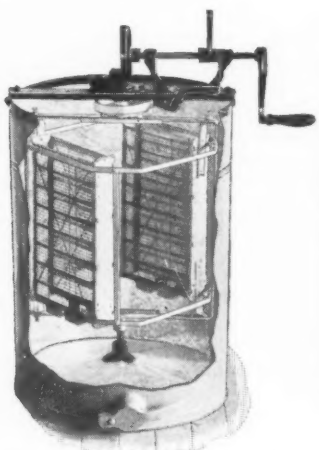
Good extracting can only be done with extractors that run at "high speed" or at 350 revolutions per minute for the eight-frame size and proportionately greater for the smaller size. When the extractor is run at about 200 revolutions per minute there is left in the combs from one-half to one pound of honey, and this unextracted honey is worse than wasted. Root's "high speed" power extractors, besides extracting all of the honey possible, are so built that they can be run at high speed without any strain. The pockets are electrically welded, which makes them very rigid and strong, and on the Buckeye extractors, four and eight frame size, they can be reversed without slowing up the machine and with **no danger of breaking the combs.**

Root Extractors Make Extracting a Pleasure

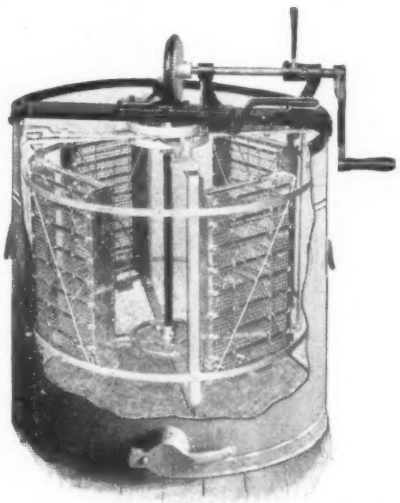
High Speed, Efficient, Big Capacity and Long Life



Buckeye four-frame Power Extractor.



Root two-frame Reversible Extractor, suitable for an apiary of 10 to 25 colonies.



Four-frame Multiple Reversing Extractor, suitable for an apiary of 25 to 100 colonies.

Three of the Biggest Sellers in the World

Besides our complete line of extractors, we have the best and latest in uncapping knives, honey storage tanks, capping-melters, wax-extractors, wax-presses, honey-strainers, oil and gasoline stoves—everything for extracting. Ten pages of our 1924 catalog are devoted to extracting. It is free to you for the asking.

THE A. I. ROOT COMPANY

MEDINA, OHIO

WEST SIDE STATION